01

Introduction to Computer

Objective of the Chapter

This chapter includes What is Computer, Evolution of Computer, Classification of Computer and its Applications, Basics of Hardware and Software, Open Source Software, Proprietary Software, IT Gadgets and their Applications, Mobile Applications.

Introduction

A computer is an electronic device that manipulates information or data according to the set of instructions called **programs**.

It has the ability to store, retrieve and process data.

The term 'computer' is derived from the Latin word 'computare', which means 'to calculate'.

The basic functions of a computer system are to accept the input, process the input, output and to store data.

What is Computer?

Generally, computer is the combination of hardware and software, which converts data into information.

Some terms used in computer terminology are described below :

- **Data** Unprocessed raw facts and figures, like numbers, text on pieces of paper, are known as data.
- **Processing** It is the sequence of actions taken on data to convert it into information.
- **Information** When data is processed, organised, structured or presented in a given context so as to be useful, then it is called information.
- **Instruction** It is a command given to a computer in the computer language by the user.
- **Program** It is a set of instructions given to a computer in order to perform some task.

Computer

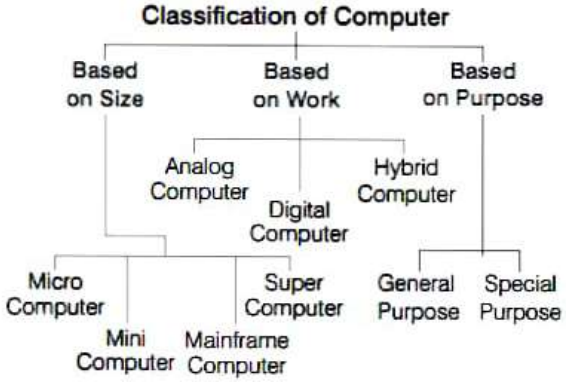
Generations/Evolution of Computer

A generation refers to the state of improvement in the development of system. Computers are made up of electromechanical, before generation. Each generation of computer is characterised by a major technological development that fundamentally changed the way.

Generation	Year	Switching Device	Storage Device	Speed Measured	Operating System	Language	Characteristics	Applications
First	1940-56	Vacuum tubes	Magnetic drums	Milli seconds	Batch operating system	Machine language (Binary number 0 s and 1s)	• Fastest computing device. • Generate large amount of heat. • Non-portable, unreliable.	Used for scientific purpose e.g. ENIAC, UNIVAC, EDVAC, etc.
Second	1956-63	Transistors	Magnetic core technology	Micro seconds	Timesharing system, Multitasking OS	Assembly language, high level language	• More reliable and less prone to hardware failure. • Portable and generate less amount of heat. • Smaller in size.	Used for commercial production e.g. NCR 304, IBM-1401, IBM 1000, etc.
Third	1964-71	Integrated Circuits (ICs)	Magnetic core as main storage	Nano seconds	Real-time system	High level languages (FORTRAN, COBOL)	• Consumed less power. • Highly sophisticated technology required. • Fast and more reliable.	Database management system e.g. PDP-8, PDP-11, IBM 360, etc.
Fourth	1971-Present	Very Large Scale Integrated (VLSI) circuit or Microprocessor	Semi conductor Memory, Winchester disk	Pico seconds	Time sharing network, GUI interface	PASCAL, ADA, COBOL-74 and FORTRAN IV	• More reliable and portable. • This generation leads to better communication and resource sharing. • Cheapest among all generations.	Distributed system, e.g. IBM 4341, DEC 10, APPLE II, etc.
Fifth	Present and Beyond	Super Large Scale Integrated (SLSI) chips or Bio chips	Optical disc	—	Knowledge information processing system	Natural language	• Able to recognise image and graphs. • Able to solve highly complex problems like logical reasoning. • Able to use more than one CPU for faster processing speed.	Artificial intelligence e.g. Robotics, etc.

Classification of Computer

Computers are mainly classified based on their different size and shapes :



Based on Size

On the basis of size, computers are categorised as follows :

1. **Micro Computers** These are the least powerful, yet the most widely used and fastest growing type of computers and are also called portable computers. Some types of micro computers are given below :
   I. **Desktop Computer or Personal Computer** (PC) These computers are small and relatively inexpensive computers. These computers are based on the microprocessor technology (Integrated Circuit).
   II. **Notebook** These computers (also known as ultra book or laptop) are portable and lightweight. First laptop was developed by Alan Kay. Laptops consume less power than desktops and include a rechargeable battery.
   III. **Handheld Computers or Palmtops** These computers are the smallest and are designed to fit into the palm. So, these computers are also known as Palmtop/PDA. They use the pen for input instead of keyboard.
2. **Mini Computers** These computers are smaller in size, faster and cost lower than mainframe computers. Initially, the mini computers were designed to carry out some specific tasks, like engineering and Computer Aided Design (CAD) calculations. They are used as central computer, which is called server. e.g. IBM-17, DEC PDP-11, HP-9000, etc.
3. **Mainframe Computers** These are the computers having large internal memory storage and comprehensive range of softwares. These computers are bigger in size comparatively to mini computers but smaller than supercomputers. Mainframe computer serves as a backbone for the entire business world. e.g. IBM-370, IBM-S/390, UNIVAC-1110, etc.
4. **Super Computers** These are the fastest and the most expensive computers. The speed of supercomputers is measured in FLOPS (Floating Point Operations Per Second). These are used for highly calculation intensive tasks, such as weather forecasting, nuclear research, business application, military agencies and scientific research laboratories. "PARAM was the first super computer of India introduced by C-DAC in Pune." As of January 2018, Pratyush is the fastest super computer in India.

Based on Work

On the basis of work, computers are categorised as follows :

1. **Analog Computers** These computers are the job oriented computers and work on the supply of continuous electrical pulses. These computers carry out arithmetic and logical operations by manipulating and processing of data. e.g. speedometers, seismograph, etc.
2. **Digital Computers** These computers work by calculating the binary digits. A digital computer not only performs mathematical problems, but also combines the bytes to produce desired graphics, sounds. e.g. desktop (PC).
3. **Hybrid Computers** These computers are the combination of analog and digital computers. Machines used in hospitals like ECG (Electrocardiography) and DIALYSIS are the commonly used hybrid computers.

Based on Purpose

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

1. **General Purpose Computers** These computers are used to solve variety of problems by changing the program or instructions, e.g. to make small database calculations, accounting, etc.
2. **Special Purpose Computers** These computers are used to solve a single and dedicated type of problems, e.g. automatic aircraft landing, multimedia computer, etc.

Applications of Computer

Now-a-days, computers have been employed in almost all the aspects of professional and personal life. Some of the areas where computers being used are given below :

- **Education** Computers have proved to be excellent teachers. Educational institutes are using computers in many ways like tele-education, virtual classroom, online classes, etc.
- **Business Application** Computers play a vital role in business to keep records of employees, sold product information and available resources are now easy.
- **Recreation and Entertainment** Computers can be found throughout the entertainment industry. Computers are used to create the special effects in television advertisements, the colorful displays on the score board at sport arenas etc.
- **Government** Various departments of the government use computer for their planning, controlling and law enforcement activities.
- **Health** Computer plays a very crucial role in this area. Activities like scanning, X-ray, tele-medicine, patient monitoring, patient records, diagnosis, etc., are performed with the help of computers.
- **Multimedia** It is the field concerned with the computer controlled integration of texts, graphics, drawings, animation, audio and any other media, where each type of information can be represented, stored, transmitted and processed digitally.
- **Banking** Computers can be used in the banks to keep the records of customer's accounts. Computers enhance customer services like checking account status, transferring money, etc.

Basics of Hardware and Software

A computer is a combination of hardware and software. These two work combinedly and make computer do for what it is instructed.

Hardware

It refers to the physical components of a computer that can be touched and seen. Monitor, Keyboard, Hard Disk Drive, Mouse, Printers, Memory, Motherboard, Graphic Cards, Sound Cards etc., are some hardware devices. By the use of these hardware devices, it made very easy for the computer for processing its data, store and retrieve.

Some hardware devices are as follows :

1. Input Devices (Unit)
2. Output Devices (Unit)
3. Central Processing Unit (CPU)
4. Computer Memory/Memory Unit

1. Input Devices

An input device is a hardware device that sends data into the computer system. These devices are used to input (or enter) data and instructions into the computer system. All instructions are accepted by the CPU through electrical pulses from various kind of input devices. Some of the input devices are Keyboard, Pointing Devices, Scanner, MICR, OCR, OMR, Barcode Reader, Microphone (Mic), Web Camera, Digital Camera, Biometric Sensor, Smart Card Reader which explained as follows :

I. Keyboard

It is the most commonly used input device which uses an arrangement of buttons and keys. Both data and program can be entered into the computer through the keyboard. It is an essential device for interactive processing because the user can easily issue commands to receive the data response immediately on the computer screen.

Layout of a Keyboard

Types of keys on Keyboard

(i) **Alphanumeric Keys** All of the letters and numbers on the keyboard are A-Z and 0-9.

(ii) **Punctuation Keys** Such as comma, period, semicolon, brackets, parenthesis and so on.

(iii) **Special Keys** Such as Control keys, Arrow keys, Caps lock key, Delete key, Alt key, Shift key etc.

(iv) **Function Keys** Keys labeled F1 to F12. These keys have different meanings depends on running program.

➥ **Note** Shift, Ctrl and Alt keys are also known as modifier keys.

II. Pointing Devices

A pointing device is used to communicate with the computer by pointing to the locations on the monitor.

It can also be used for

- sending command signals to the computer.
- selecting items on the screen.
- selecting commands from command menu.
- drawing graphics, sketches, etc.

Some commonly used pointing devices are mouse, joystick, light pen, graphics tablet, touch screen and trackball.

(i) **Mouse** It is a pointing device that allows to control the movement of pointer (also known as **mouse pointer**) on screen. Mouse performs various functions by detecting two-dimensional motion relatively to its supporting surface. Generally, a mouse has two buttons-right button and left button.


Wired Mouse


Wireless Mouse

Mouse also includes a scroll wheel between these two buttons to scroll down the application window and their contents also. These are three types of mouse as – Wireless mouse, Mechanical mouse, Optical mouse.

There are four actions of mouse as follows :

(a) **Click or Left click** selects an item on the screen.

(b) **Double click** is used to open a document or program.

(c) **Right click** displays a list of commands on the screen. Right clicking is used to access the properties of selected object.

(d) **Drag and Drop** is used to move an item on the screen.

(ii) **Joystick** It is a pointing device that moves in all directions and controls the movement of the cursor. A joystick is similar to a mouse excepts that the movement of cursor on screen stops working as soon as user stop moving the mouse.


Joystick

But with a joystick, the pointer continuous moving in the previously pointing direction.

Commonly, joysticks are used for playing computer games like flight simulators but occasionally used for CAD/CAM systems and other applications.

(iii) **Light Pen** It is a handheld electro-optical pointing device, which is used for making drawings, graphics and for menu selection. It senses the light from the screen when it becomes closer and generates a pulse.


Light Pen

Light pen is used especially in Personal Digital Assistants (PDA). It is very useful in identifying a specific location on the screen.

(iv) **Graphics Tablet** A graphics tablet (or digitisers, digitising tablet, or simply tablet) is an input device that consists of an electronic writing area and a special pen that works with it.


Graphics Tablet

It allows artists to create hand-made images and graphical images with motion and action, similar to the way a person draws images with pencil and paper.

When user draws anything on the tablet with the special pen, the drawing appears on the screen. Graphics tablet may also be used to capture data or handwritten signatures.

(v) **Touch Screen** It is an electronic visual display that can detect the presence and location of a touch within the display area. The term touch screen generally refers to touching the display of the device with a finger or hand.


Touch Screen

The touch screen sends a signal to the computer. This signal gives the location on the screen, which has been touched. Touch screen is quick and simple to use. Generally, smartphones have a high-resolution capacitive touch screen.

There are different types of touch screens available with electronic devices like capacitive touch screen, resistive touch screen and gorilla glass touch screen, etc.

(vi) **Trackball** It is designed for computers, generally serves as mouse replacement. It is primarily used to move the cursor on the screen. The trackball has a ball on its top. Trackball can be rolled with fingers and the internal rollers sense the motion, which is transmitted to the computer.


Trackball

Trackballs are common on CAD workstations and sometimes seen on computerised special purpose work stations, such as the radar consoles in an air-traffic control room or sonar equipment on a ship or submarine.

III. Scanner

It is an input device that makes copies and reproduces text and images and convert it into a digital file, allowing the computer to read or display the scanned object. Scanners can be used for storing the documents in their original form that can be modified and manipulated later on. It is mainly used to convert a scanned document in a digital format. Scanners come in a variety of sizes from hand held models to desktop models as Handheld scanners, Flatbed scanners and Drum scanners.


Scanner

IV. MICR (Magnetic Ink Character Recognition)

It is a character recognition technology which is primarily used by the banking industry to facilitate the processing of cheques. This technology allows the computer to read information (such as account numbers) on printed documents.


MICR

MICR can read upto 2400 documents/min. The MICR coding system contains 14 characters (4 special symbols and 10 decimal digits). So, it can recognise these 14 characters only. The type font E-13 B, a standard typographical style, is used to print the characters or identification marks.

V. **OCR** (Optical Character Recognition)

It is used to translate scanned images of handwritten, type-written, printed text or special type font printed on conventional paper with conventional ink into machine-encoded text.

OCR

OCR is widely used to convert books and documents into electronic files, to computerise a record-keeping system in an office or to publish the text on a website.

An optical reader uses photoelectric devices to scan the characters being read and convert the reflected light patterns of the data into binary data suitable for computer input. The normal speed of an OCR is 1500 to 3000 characters per second.

The technology is being developed for greater accurate recognition and is also known as Intelligent Character Recognition (ICR).

VI. **OMR** (Optical Mark Reader)

OMR is the process of detecting the presence of intended marked responses. OMR is mainly used to detect marks on a paper. It uses a beam of light that is reflected on the paper with marks, to capture presence and absence of data (Marks).

OMR

The OMR reader interprets the patterns of marks into a data record and sends this to the computer for storing, analysing and reporting. OMR is widely used to read the answer of objective type tests, voting applications and other evaluations studies.

VII. **Barcode Reader**

It is an input device used for reading printed bar codes (Universal Product Code) available on product to be sold. A barcode reader emits a beam of light, which reflects off the barcode image. A light sensitive detector in the barcode reader identifies the barcode image by recognising special bars at both the ends of the image.

Barcode Reader

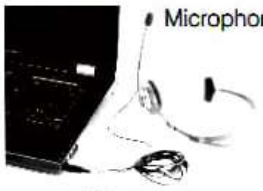
Once code is identified, it is converted into a numeric code. A perfect example of a barcode reader is its use in a super market where barcode scanner reads the price of a product.

A barcode is a machine readable representation of information in the form of stripes of dark and light ink.

VIII. **Microphone** (Mic)

We can send sound to the computer through a special manual input device called microphone or mic. A mic converts the received sound into computer's format, which is called Digitised Sound or Digital Audio. To convert a voice into digital form, an additional hardware is always needed which is known as Sound Card.

Sound is used most often in multimedia, where user can make his/her presentation more attractive using recorded narration, music or sound effects.



Microphone

A microphone can be attached to a computer to record sound. Now-a-days, microphones are also being used with speech recognition software. This means that you do not have to type the document, rather just have to speak and the spoken words appear in your document.

IX. **Web Camera** (Webcam)

Webcam is a digital camera attached to computers and can be used for video conferencing or online chatting, etc. It is a video capturing device. Webcams are able to capture full motion videos as well. A webcam connected to a computer allows the user to view either a still picture or motion video of a user or other object.

Webcam Attached with Computer

Webcam

Web Camera

Now-a-days, webcams are either embedded into the display with laptops or connected *via* USB or firewire port or Wi-Fi to the computer system. After connecting webcam to a computer, you need to install a required software or drivers.

X. **Digital Camera** (Digicam)

It is an input device that stores the pictures or videos in an electronic format instead of film. There are several features that make digital camera a popular choice, when compared to film cameras. Most enjoyable feature is the LCD display on the digital camera. This display allows users to view and save photos or videos after the picture or video has been taken, that means, if you take a picture and don't like the results, you can delete it, or if you like the picture, you can save it and easily show it to other people.

Digital Cameras

XI. **Biometric Sensor**

It is a device which recognises physical or behavioural traits of an individual. Biometric sensors are mainly used marking attendance of employees/students in organisations/institutions.

Biometric Sensor

Biometric sensors are working with accuracy, so these can be widely used in security purpose.

XII. **Smart Card Reader**

It is a device which is used to access the microprocessor of a smart card. There are two kinds of smart cards.

Smart Card Reader

Memory cards the cards which contain only non-volatile memory storage components and some specific security logic.

Microprocessor cards contain volatile memory and microprocessor components. The card is made-up of plastic generally PVC. Smart cards are used in large companies and organisation for stronge security authentication.

2. Output Devices

An output device is a part of computer hardware equipment, used to communicate the results of data processing which are carried out by the information processing system (such as a computer), to the outside world. Output devices carry the results of various operations performed by the user. Output device makes it possible to view or print data.

Some of the devices, which are used to display the processed result or output are Monitor, Printer, Plotter, Speaker, Headphone, Projector, Speech synthesizer which explained as below :

I. **Monitor/VDU**

A monitor (called a Visual Display Unit, VDU) is an electronic visual device used to display the output. The rectangular area of the monitor, its refresh rate and dot pitch, all directly affect the resolution of the display.

A monitor is of two kinds : Monochrome display monitor and Color display monitor.

A monochrome display monitor uses only one color to display text and color display monitor can display 256 colors at a time.

An image on the monitor is created by a configuration of dots, also known as pixels.

The clarity of image depends on three factors :

- **Resolution of Screen** Resolution refers to the number of pixels in horizontal and vertical directions. The resolution of monitor is higher when the pixels are closer together.
- **Dot Pitch** It refers to the diagonal distance between two colored pixels. The smaller the dot pitch, the better the resolution.
- **Refresh Rate** The refresh rate of a monitor is the maximum number of times the image on screen can be drawn or refreshed per second.

The popular types of monitor are as follows :

(i) **CRT** (Cathode Ray Tube) The CRT works in the same way as a television. It contains an electron gun at the back of the glass tube. This gun fires electrons in a group of phosphor dots, which is coated inside the screen. When the electrons strike the phosphor dots they glow to give the colours.


CRT

(ii) **LCD** (Liquid Crystal Display) These screens are used in laptops and notebook sized PCs. A special type of liquid is sandwiched between two plates. It is a thin, flat and light weight screen made up of any number of colours or mono-chrome pixels arranged in front of a light source. Long life, light weight, better screen privacy, less eyestrain, reduced radiation are some of the major features of LCD.


LCD

(iii) **LED** (Liquid/Light Emitting Diode) LED is an electronic device that emits light when electrical current is passed through it. LEDs usually produce red light, but today's LEDs can produce RGB (Red, Green and Blue) light and white light as well.


LED

(iv) **3-D Monitor** 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, user feels involved with the scene and this experience is called virtual reality.

(v) **TFT** (Thin Film Transistor) TFT and Active-Matrix LCD (AMLCD) is a Liquid Crystal Display (LCD). With active-matrix display, each pixel is controlled by one to four transistors that can make the screen faster, brighter, more colourful than passive-matrix and capable of being viewed at different angles. Because of this improved technology, active-matrix screens are often more expensive but have better quality than a passive-matrix display.

II. Printer

It is an output device which produces a hard copy of documents that are stored in an electronic form on physical print media such as paper or transparencies. So, printers are the primary output devices used to prepare permanent documents.

The speed of a printer is normally rated either by Pages Per Minute (PPM) or by Characters Per Second (CPS). Printer resolution is a numerical measure of print quality that is measured in Dots Per Inch (DPI).

Printers can be classified into two broad categories as follows :

(i) **Impact Printers** These printers rely on a forcible impact to transfer ink to the print media, similar to the action of a typewriter. There is a mechanical contact between the paper and the print head.

There are various types of impact printers as follows :

(a) **Line Printer** It is a high speed printer capable of printing an entire line of text at once instead of one or more characters at a time. Print quality of line printer is not high.


Line Printer

(b) **Drum Printer** It is an old line printer technology that is used to form character images around a cylindrical drum as its printing mechanism.

When the desired character for the selected position rotated around the hammer line, the hammer hits the paper from behind and pushed it into the ribbon and onto the character.


Drum Printer

(c) **Daisy Wheel Printer** It can print one character at a time. In daisy wheel printer, round disk extends a portion of the wheel making contact with ink ribbon that makes contact with paper for creating the character. This procedure is repeated for each key when it is pressed. These printers are fitted with unchangeable print heads called daisy wheels. To print each character, the wheel is rotated and the appropriate stoke struck against an inked ribbon. Daisy wheel printers cannot produce high quality print graphics. The speed of this printer is about 100 CPS.

(d) **Dot Matrix Printer** The term dot matrix refers to the process of placing dots to form an image. It uses print heads to shoot ink or strike an ink ribbon to place hundreds to thousands of little dots to form text or images. It prints one character at a time. The speed of dot matrix printer lies between 200 to 600 CPS.

(ii) **Non-impact Printers** These printers are much quieter than impact printers as their printing heads do not strike on the paper.

These printers are comparatively faster and produce high quality output. They can be used for printing text and graphics both in black & white and colored.

The various types of non-impact printers are as follows :

(a) **Electromagnetic Printer** Electrographic or electro-photographic printers are very fast printers and they fall under the category of page printers. They can produce documents at a speed of over 20000 lines per minute i.e. more than 250 pages per minute.

(b) **Thermal Printer** Thermal printer paper tends to darken over time due to exposure of sunlight or heat. The standard of print produced is poor. Thermal printers are widely used in battery powered equipment such as portable calculators.

(c) **Electrostatic Printer** These printers are generally used for large format printing.

They are favoured by large printing shops because of their ability to print fast and making low cost.

(d) **Laser Printer** In this printer, the method of printing is based on principle of electrophotography and use a beam of laser light as a photocopy machine. Resolution of laser printer is specified in term of DPI (Dots Per Inch).


Laser Printer

The powdered ink (i.e. toner) is transferred to paper to form a text/an image pattern and then fixed by heat or pressure. When it is used to print bulk of papers, the laser printer produces the cheapest cost per printout.

(e) **Inkjet Printer** This printer fires extremely small droplets of ink onto the paper to create impression of text or image. The printhead of inkjet printers, known as print cartridge, contains tiny nozzles (50 or more) through which different coloured inks can be sprayed onto the paper to form the characters or graphic images.


Inkjet Printer

Colour inkjet printers provide an inexpensive way to print fully coloured documents.

III. **Plotter**

It is an output device similar to a printer that uses a pen, pencil, marker or other writing tools to make a design.


Plotter

Plotters are generally used to generate the map of building and shopping malls. A plotter is a computer printing device for printing vector graphics. In the past, plotters were widely used in applications such as Computer Aided Design (CAD) and other printing jobs. Though, they have generally been replaced with wide-format conventional printers.

There are two basic types of plotters those that use pens and those that do not. There are two basic types of plotters as follows :

(i) **Drum Plotter** It contains a long cylinder and a pen carriage. The output paper is placed over the drum. The pen is mounted horizontally on the carriage. Both the pen and drum move under the computer's control to produce the desired drawing.

(ii) **Flatbed Plotter** It consists of a stationary horizontal flat surface on which paper or any other medium is fixed. The pen is mounted on a carriage that can move along the horizontal and vertical axis.

IV. **Speaker**

It is an output device that receives the sound in the form of electric current from the sound card and convert it into sound format. Speakers are used for listening music. Computer speakers (multimedia speakers) are the speakers, which are attached internally or externally to a computer system.


Speaker

V. **Headphones**

These are a pair of small loudspeakers or less commonly a single speaker, held close to a user's ears and connected to a signal source such as an audio amplifier, radio, CD player or portable media player. They are also known as stereo phones, headsets or cans.


Headphones

VI. **Projector**

It is an output device which is used to project information from a computer onto a large screen, so it can be viewed by a large group of people simultaneously. Projectors are widely used for classroom training or conference holes with a large audience. It provides a temporary output display.

VII. **Speech Synthesizer**

It is used to produce sound from a text and can be implemented in software and hardware. A text-to-speech system converts normal language text into speech.

3. Central Processing Unit (CPU)

It is the part of a computer system that carries out the instructions of a computer program, to perform the basic arithmetical, logical and input/output operations of the system.

The CPU is also known as the brain of the computer. The speed of CPU depends upon the type of microprocessor used and it is measured in MegaHertz (MHz).

Two typical components of a CPU are Arithmetic Logic Unit and Control Unit.

I. Arithmetic Logic Unit

In computing, an Arithmetic Logic Unit (ALU) is a digital circuit that performs arithmetic and logical operations. The ALU is a fundamental building block of the central processing unit of a computer. ALU uses registers to hold the data that is being processed. Most ALUs can perform the following operations :

- **Logical Operations** (AND, NOT, OR, XOR)
- **Arithmetic Operations** (addition, subtraction, multiplication and division)
- **Bit-shifting Operations** (shifting or rotating a word by a specified number of bits to the left or right, with or without sign extension)
- **Comparison Operations** (=, <, <=, >, >=)

Microprocessor and Register

Register It is the internal part of CPU which gives special purpose location to arithmetic logic unit and control unit. These are used to store intermediate results obtained during the execution of instructions.

Microprocessor It is fabricated on a single IC (Integrated Circuit). IC is a piece of silicon, composed by thousands of transistors.

The first chip, Intel 4004, made by Intel in 1971 by scientist Ted Hoff and engineer Federico Faggin. Some of the popular microprocessors are i5, i3, Core 2 Dual Intel, Dual Core, Pentium IV, etc.

II. Control Unit

It coordinates the input and output devices of a computer system. Control Unit (CU) fetches the instructions which are given in the form of micro-programs. It directs the operation of other units by providing timing and control signals. In general, CU is a central part of the computer that controls its operations and entire processing. The control unit is the circuit that controls the flow of data through the processor and coordinates the activities of the other units within it. Control unit acts like human nerves system, which does not process data but behaves as a central unit for other data manipulating components.

4. Computer Memory

The computer memory is one of the most important elements in a computer system. It is the internal or external storage area, which holds the data and instructions during processing in the form of binary numbers.

It also relates to many devices and components that are responsible for storing data and applications on a temporary or a permanent basis. Computer memory can be classified into two types— Primary memory and Secondary memory/Storage device.

I. Primary Memory

It is also known as main memory. It is the internal memory used by computer to hold data and instructions. The primary memory has limited storage capacity. Primary memory holds the data and programs needed at that instant by CPU. Primary memory is volatile in nature i.e. it requires constant power supply to motion the current information.

There are two types of primary memory i.e. RAM and ROM.

(i) **RAM** RAM stands for Random Access Memory. It is the internal memory that can be read from as well as written to. This memory is often associated with volatile types of memory. It can hold data only on temporary basis because it requires a continuous flow of electrical current.

RAM

If current is interrupted, data is lost.

The two main forms of RAM are as follows :

(a) **Static RAM** It is also written as SRAM. It is a computer memory that requires a constant power flow in order to hold information. SRAM is more expensive and requires more power therefore, it is commonly used in cache and video card memory. It is faster than DRAM.

SRAM can be further classified as

- Non-volatile SRAM
- Special SRAM
- Asynchronous SRAM
- Synchronous SRAM

(b) **Dynamic RAM** It is also written as DRAM. It stores information in a cell containing a capacitor and transistor. These cells must be refreshed with electric impulses in few milliseconds. This process allows memory to keep charge and hold the data as long as needed. It can be further classified as

- Synchronous DRAM
- Rambus DRAM
- Double Data Rate Synchronous DRAM

(ii) **ROM** In ROM (Read Only Memory), information once stored remain fixed, i.e. it can not be changed. So, ROM can only be read and used. The contents of ROM remain stored even if power is turned OFF. This memory is often associated with non-volatile types of memory. ROM cannot be altered once the chip has been made.

ROM

ROM is further sub-divided into three types :

(a) **PROM** (Programmable Read Only Memory) It is a computer memory chip capable of being programmed after it has been created. But once the PROM has been programmed, the information written is permanent and cannot be erased or deleted.

(b) **EPROM** (Erasable Programmable Read Only Memory) It is a computer memory chip on which the written information can be changed by exposing to ultra voilet light. It is just like a small glass circle that expose the chip that can be re-programmed.

(c) **EEPROM** (Electrically Erasable Programmable Read Only Memory) It is a PROM that can be erased and reprogrammed using an electrical charge.

Cache Memory

It is a storage buffer that stores the data that is used more often, temporarily and makes them available to CPU at a fast rate.

The data and instructions that are required during the processing of data are brought from the secondary storage devices and stored in the RAM.

Cache memory is a very high speed memory placed in between RAM and CPU. Cache memory increases the speed of processing.

Cache memory is very expensive, so it is smaller in size. Generally, computers have cache memory of sized 256KB to 2MB.

II. Secondary Memory/Storage Device

Secondary memory, also known as Secondary Storage or Auxiliary Memory, is the slower and cheaper form of memory. It is a permanent storage device. CPU does not access the secondary memory directly. The content in it must first be copied into the RAM to be processed. Secondary memory is non-volatile in nature, i.e. the information does not get erased even when the power is switched OFF and data will not be destructed until and unless the user erases it.

Secondary Memory Devices include

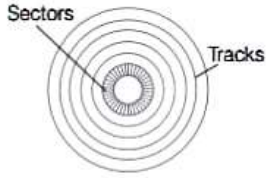
Magnetic Disks	Optical Discs	Solid State
Floppy Disk	CD	Pen/Flash Drive
Hard Disk Drive	DVD	
Magnetic Tape	Blu-ray Disc	

(i) **Floppy Disk** (Diskette) A Floppy Disk Drive (FDD) is a computer disk drive that enables a user to save data on removable diskettes. This portable storage device is a rewritable media and can be reused a number of times. It is made of plastic with magnetic coating on it. It is round in shape and is covered by square plastic jacket. Floppy disks are commonly used to move files between different computers. Although 8" disk drives made available in 1971

were the first real disk drives, the first widely used floppy disk drives were the 4", $5\frac{1"}{4}$, which were later replaced with $3\frac{1"}{2}$ floppy disk drive. However, today these drives are replaced with CD-R and other writable disk drives and flash drives.

(ii) **Hard Disk Drive** A Hard Disk Drive (HDD) is a non-volatile and random access digital data storage device. It is a data storage device used for storing and retrieving digital information using rotating disks (platters) coated with magnetic material. All programs of a computer are installed in hard disk within a particular drive.

Hard Disk Drive



Tracks and Sectors

It consists of a spindle that hold non-magnetic flat circular disks, called platters, which hold the recorded data. Each platter requires two read/write heads, that is used to write and read the information from a platter. All the read/write heads are attached to a single access arm so that they cannot move independently.

The information is recorded in bands, each band of information is called a track. Each platter has the same number of tracks and a track location that cuts across all platters is called a cylinder. The tracks are divided into pie-shaped sections known as sectors.

(iii) **Magnetic Tape** It is a medium of data storage, made up of a magnetic material. It is a storage medium on a large open reel or in a smaller cartridge or cassette (like a music cassette). It is used for those applications that are based on sequential data processing i.e. it is a sequential data access medium.

Due to this (sequential data access) nature, these tapes are not suitable for data files that need to be revised or updated often. They are generally used to store backup data or that type of data, which is not frequently used or to transfer data from one system to another.

(iv) **Compact Disc** (CD) It is an optical media that is used to store digital data. It is relatively cheap, small, portable and round in shape storage medium which is made up of molded polymer. It consists of a circular disc, which is coated with a thin metal that is highly reflective. Laser beam technology is used for recording/reading of data on the disc. It is also known as laser disc or optical laser disc, due to the use of laser beam technology. CD provides random access medium for high capacity secondary storage. The diameter of the CD ranges from 10cms to 30cms. One CD can store 600 MB to 750 MB.

Compact discs are categorised into three parts as follows :

(a) Compact Disc-Read Only Memory (CD-ROM)

(b) Compact Disc-Recordable (CD-R)

(c) Compact Disc-Rewritable (CD-RW)

(v) **Digital Video Disc** (DVD) It is also known as Super Density (SD) disc. A DVD is an optical disc storage media manufactured for the first time by Philips, Sony, Toshiba and Panasonic in 1995. DVDs offer higher storage capacity than compact discs while having the same dimensions. Depending upon the disk type, DVD can store several Gigabytes of data (4.7 GB-17.08 GB). DVDs are primarily used to store music or movies and can be played back on your television or on the computer too. They are not rewritable media.

DVDs come in three varieties :

(a) DVD ROM (DVD-Read Only Memory)

(b) DVD-R (DVD-Recordable)

(c) DVD-RW (DVD-Rewritable)

(vi) **Blu-ray Disc** (BD) It is an optical disc storage medium designed to recapture the data normally in DVD format. Blu-ray discs contain 25 GB (23.31 GB) per layer space. The name blu-ray disc refers to the blue laser used to read the disc, which allows information to be stored at a greater density. Blu-ray can hold almost 5 times more data than a single layer DVD. The variations in the formats are as follows :

(a) BD-ROM (Read only) for pre-recorded content

(b) BD-R (Recordable) for PC data storage

(c) BD-RW (Rewritable) for PC data storage

(d) BD-RE (Rewritable) for HDTV recording

(vii) **Pen/Flash/Thumb Drive** A flash drive is a data storage device that consists of flash memory (USB memory/key memory) with an integrated, Universal Serial Bus (USB) interface. USB flash drives are typically removable, rewritable and physically much smaller than a floppy disk. A USB flash drive, thumb drive and a pen drive is a portable drive that is same as the size of your thumb that connects to the computer USB port. Today, flash drives are available in various storage capacities as 256 MB, 512 MB, 1 GB, 4 GB, 16 GB, 64 GB, etc. Flash drives are widely used as an easy and small medium to transfer and store the information from the computers.

Pen Drive

(viii) **Memory Stick** It is USB-based flash memory drive. A family of flash memory cards from Sony designed for digital storage in cameras, camcorders and other handheld devices. Capacity of memory stick varies from 4 MB to 256 MB.

Memory Stick

Basic Units of Measurement

When user uses a RAM, ROM, Floppy disk or Hard disk, the data is measured using some units. In computer terminology, they are called Nibble, Bit, Byte, Kilobyte, Gigabyte etc.

Units of Computer Memory Measurements

Bit (Binary digit) The smallest unit of data. It is either 0 or 1.

Nibble A group of 4 bits or half a byte.

Byte A group of 8 bits. A byte can represent 256 (2^8) distinct values, such as the integers from 0 to 255. Each keyboard character is represented through atleast 1 byte.

Kilobyte (KB) It is actually 2^{10} bytes or 1 KB = 1024 bytes.

Megabyte (MB) It is actually 2^{20} bytes or 1 MB = 1024 KB.

Gigabyte (GB) It is actually 2^{30} bytes or 1 GB = 1024 MB.

Terabyte (TB) It is actually 2^{40} bytes or 1 TB = 1024 GB.

Petabyte (PB) It is actually 2^{50} bytes or 1 PB = 1024 TB.

Exabyte (EB) It is actually 2^{60} bytes or 1 EB = 1024 PB.

Zettabyte (ZB) It is actually 2^{70} bytes or 1 ZB = 1024 EB.

Yottabyte (YB) It is actually 2^{80} bytes or 1 YB = 1024 ZB.

Brontobyte It is actually 2^{90} bytes or 1 Brontobyte = 1024 YB

Geopbyte It is actually 2^{100} bytes or 1 Geopbyte = 1024 Brontobyte.

Geopbyte is the highest and bit is the smallest memory measurement unit.

Note

Peripherals are the external input-output devices and storage media.

Software

It is a collection of computer programs, procedures and related data that provide the instructions for telling a computer what to do and how to do it.

It is responsible for controlling, integrating and managing the hardware components of a computer system and for accomplishing specific tasks.

Software can be divided into following major categories :

1. System Software
2. Application Software
3. System Utilities

1. System Software

It consists of several programs, which are directly responsible for controlling, integrating and managing the individual hardware components of a computer system.

System software also provides the interface between the user and components of the computer. Some common examples of system software are as follows :

I. Operating System

It consists of programs, which control, coordinate and supervise the activities of the various components of a computer system. Its function is to provide link between the computer hardware and the user.

Operating System (OS) performs all internal management functions (disk access, memory management, task scheduling and user interfacing) and ensures systematic functioning of a computer system.

It provides an environment to run the programs. e.g. MS-DOS, Windows XP/2000/98, Unix, Linux, etc.

II. Device Drivers

A software, which is written with the objective of making a device functional when it is connected to the computer is called device driver. It is a system software that acts like an interface between the device and the user.

Every device, whether it is a printer, monitor, mouse or keyboard has a driver program associated with it for its proper functioning. Device drivers are not independent programs, they assist and are assisted by operating system for the proper functioning.

Linker

It is a system program that links together several object modules and libraries to form a single and coherent program (executable). The main purpose of linker is to resolve references among files. Before execution of the program, modules and required libraries are linked together using the linker software.

Loader

It is a kind of system software which is responsible for loading and relocation of the executable program in the main memory. It is a part of operating system that brings an executable file residing on disk into memory and starts its execution process.

III. Language Translator

It helps in converting programming languages to machine language. The translated program is called object code.

There are three different kinds of language translators as follows :

(i) **Assembler** It is used to convert the assembly language into machine language (i.e. in the form of 0 or 1). This language consists of mnemonic codes, which are difficult to learn and is machine dependent.

(ii) **Compiler** It is used to convert the source code (written in high level language) into machine language. Compiler reads whole source code in a single run and traps the errors and inform to the programmer. For each

high level language, the machine requires a separate compiler.

(iii) **Interpreter** This program converts a high level language program into machine language by converting it line-by-line and inform to the user as an error occurs.

2. Application Software

It is a computer software designed to help the user to perform singular or multiple tasks. It is a set of instructions or programs designed for specific uses or applications, that enable the user to interact with a computer. Application softwares are also called the end-user programs. There are two types of application software as follows :

I. General Purpose Software

These softwares are used for any general purpose (or function). These softwares allow users to do simple (general) computer tasks.

Some of the general purpose application softwares are as follows :

- Word Processing Software
- Presentation Software
- Electronic Spreadsheet
- Database Management System
- Desktop Publishing Software
- Graphics Software

II. Specific Purpose Software

These are created to execute one specific task. This type of application software generally has one purpose to execute.

Some of the specific purpose application softwares are described below :

- Inventory Management System and Purchasing System
- Payroll Management System
- Hotel Management System
- Reservation System
- Report Card Generator Software
- Accounting Software
- HR Management System
- Attendance System
- Billing System

3. System Utilities

These programs perform tasks related to the maintenance of the computer system. These are the packages which are loaded into computer during time of installation of operating system.

They are used to support, enhance, expand and secure existing programs and data in the computer system. System utility mainly consists of the following functions :

I. Disk Compression

It increases the amount of information that can be stored on a hard disk by compressing all information stored on a hard disk. This utility works automatically and the user does not need to be aware of its existence.

II. Disk Fragmenter

It detects computer files whose contents are broken across several locations on the hard disk and moves the fragments to one location to increase efficiency.

III. Backup Utilities

It can make a copy of all information stored on a disk and restore either the entire disk or selected files.

IV. Disk Cleaners

It is used to find files that have not been used for a long time. This utility also serves to increase the speed of a slow computer.

V. Antivirus or Virus Scanning

It is the utility, which is used to scan computer for viruses and prevent the computer system files from being corrupt. e.g. Norton, Quick heal, etc.

Open Source Software

Open source refers to something that can be modified are shared as its designed publicly accessible.

Open Source Software (OSS) is any computer software that is distributed with its source code available for modification.

Examples of Open Source Software are Linux, Unix, MySQL etc. To be considered as open source software by the software development industry, certain criteria must be met as follows :

- Software must be available free or at a low cost.
- Source code must be included.
- Anyone must be allowed to modify the source code.
- Modified versions can be redistributed.

Criteria for the Distribution of OSS

Open source software is normally distributed with the source code under an open source license. The distribution terms of open source software must comply with the following criteria :

1. **Free Redistribution** The license shall not restrict any party from selling or giving away the software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.
2. **Source Code** The program must include source code and allows distribution with source code as well as a compiled form. The source code must be in the preferred form in which a programmer would modify the program.
3. **Integrity of The Author's Source Code** The license may restrict source code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time.

Proprietary Software

It is a software that is owned by an individual or a company. There are almost always major restrictions on it to use and its source code is always kept secret. Proprietary software is copyrighted and bears limits against use, distribution and modification that are imposed by its publisher, vendor or developer.

Main Barriers for Using Proprietary Software

1. Licenses and maintenance of proprietary software are very expensive.
2. It is developed for a single purpose, applications are separately packaged.
3. Vendor support is conditional to maintenance subscription.
4. Users have to dependent on the developer of proprietary software for all updates, support and fixes.
5. Low level of customization and adaptability.

IT Gadgets and their Applications

A gadget is a device that has a specific function, in addition usually has small dimensions. It is very practical and is always in accordance with new technologies.

Some IT gadgets are as follows :

1. Tablet

It is a wireless touch screen Personal Computer (PC) that is smaller than a notebook but larger than a smart phone. Earlier tablets used either a keyboard or a stylus for inputting but now mostly tablets use touch screen to input the data or information. Many tablets now support multi-touch input which allows you to perform gesture with multiple fingers such as pinching an image to zoom out or spreading your fingers apart to zoom in.

Most popular tablet computers are Apple Pad, Samsung Galaxy tab etc.

Tablet

2. Smartphone

Smartphone is a cell phone that allows you to do more than make phone calls and send text messages. Smartphones use browsers and other softwares like a computer system. There is a touch screen in smartphone to interact with user means use to enter data or information.

In turn, a smartphone also offers capabilities such as support for biometrics, video chatting, digital assistants and much more.

Smartphones are run with the help of mobile operating systems such as Android, Symbian, iOS, BlackBerry and Windows mobile.

Smart Phone

3. Smart Band

Smart bands are called smart bracelets or connected bracelets. In most cases, they have a simple form and their main function is to track and analyse your movements during the day. That's why, most smart bands have a pedometer and sometimes also an optical heart rate sensor and various other sensors.

Smart Band

4. Bluetooth Speakers

Bluetooth speakers are a type of wireless speakers that are aimed at improving convenience and comfort of listening to music or watching videos.

Bluetooth Speakers

5. Smart Watch

Smart watch is a wearable computing device that closely resembles a wristwatch. Many smart watches are connected to a smart phone that notifies the user of incoming calls, e-mail messages and notifications from applications. Some smart watches are able to make calls. Smart watches can be smart bands with pedometers and heart rate monitors to help users track their health.

Smart watches available today include Sony smart watch, Samsung Galaxy Gear, Nikefuel and Pebble watch.

Smart Watch

6. Google Glass

It is a wearable computing device which comes with a head mounted display, in the form of eyeglasses. The google glasses function as a hands free smart phone, letting users access the mobile internet browser, camera, maps, calendar and other apps by

voice commands. It is powered by Android mobile operating system and compatibility with both Android powered mobile devices and Apple iOS, powered devices .

Google Glass

7. Drone Camera

It is the captured of still images and video by a remotely-operated or autonomous Unmanned Aerial Vehicle (UAV), also known as Unmanned Aircraft System (UAS) or more commonly as a drone.

Drone Camera

8. Spy Pen

Spy pen is an ordinary pen with a hidden digital camera concealed inside, allowing the user to take video, images often with the pen placed in a shirt pocket or held in a hand. This type of device is usually used for protection, safety and even investigation. Some spy pens have built-in memory in various sizes and some have memory cards in various sizes.

Spy Pen

Mobile Applications

Mobile applications (also known as mobile apps) are software programs developed for mobile devices such as smartphones and tablets. They turn mobile devices into miniature powerhouses of functions and fun. Some devices come preloaded with some mobile app courtesy of their manufactures or the mobile service providers with which they are associated (for example, Verizon, AT & T, T-Mobile etc.), but many more apps are available through device specific app stores (e.g. Google Play Store etc.).

Mobile apps are move away from the integrated software systems generally found on PCs. Instead, each app provides limited and isolated functionality such as game, calculator or mobile web browsing.

Mobile App Functions

The purpose of these apps run the approach from utility, productivity and navigation to entertainment, sports, fitness and just about any other imaginable. Social media is one of the most popular fields of mobile app development and adoption. In fact, Facebook is the most widely used app across all platforms. Many online entities have both mobile websites and mobile apps. In general, the difference lies in purpose : An app is usually smaller in scope than a mobile website, offers more interactivity.

Most Widely used Mobile Apps in India

1. BHIM (Bharat Interface for Money) App

This app is used to make simple, easy and quick payment transactions using UPI (Unified Payment Interface). BHIM app was launched by PM Narendra Modi on 30th December, 2016. It has been named after the architect of the India's Constitution Dr B R Ambedkar, the BHIM app is an aggregator of UPI services across various banks. The aim to launch the BHIM app to make cashless payments.

Key Features of BHIM App

- Money can be transfered using mobile number or account number.
- It helps to receive and transfer money directly into bank accounts.
- Its two factor authentication ensures your transactions are safe and secure.
- It makes cashless digital India.
- It provides transaction history.
- User can pay by scanning the QR code through scan and pay. You can also generate your QR code.

2. IRCTC Connect App

IRCTC (Indian Railway Catering and Tourism Corporation) has released its officials Android App called IRCTC Connect on 9th October, 2014 .

It can be downloaded from the Google Play Store. This app allows users to login to their IRCTC accounts and search, book, view and cancel train tickets.

Key Features of IRCTC Connect App

- User can check the schedule of train.
- User can check the availability of the seat in any train.
- It can keep the passengers upto date for their train journey.

3. Paytm App

Paytm is India's largest mobile payments and commerce platform. Paytm was founded on August 2010 by its founder Vijay Shekar Sharma in Noida.

Paytm app is best for individuals to make payments of DTH, mobile recharge, or send money to other and services like Uber, Book my show etc.

Key Features of Paytm App

- User can shop on Paytm mall which is available on Paytm App.
- User can recharge their phone bills, electricity bills, etc.
- User can book train tickets, bus tickets, movie tickets, etc., on Paytm App.

4. MyGov App

It is Government of India's innovative citizen engagement platform direct citizen participation in governance by providing an avenue for channelizing their ideas and comments. It was launched on 26th July, 2014. Google became the first multinational firm to collaborate with MyGov.

Key Features of MyGov App

- MyGov has various features and initiatives that provide you a readymade interface to connect with the government on regular basis.
- It also gives you the opportunity to connect and engage with government representatives through live chats.

5. DigiLocker App

It is a digital locker to store all official documents that linked to both Aadhaar Card and cellphone numbers. It was launched by Prime Minister on 1st July, 2015. Initially, it had 100 MB space and was later increased to 1 GB. According to latest statistics, DigiLocker has 1.35 crore users with people using it for PAN Cards, marksheets, caste certificate, birth certificates, ration cards, etc.

Key Features of DigiLocker App

- It provides an online account with 1GB storage space to Aadhaar holders.
- These documents can be shared by residents with governments or other registered organisations.
- It ensures easy availability of documents online.
- It reduces the use of physical documents and fake documents.

6. GARV (Grameen Vidyutikaran) App

GARV app is used to monitor the progress of the rural electrification scheme and provides real time updates. This app was launched in October 2015. GARV app is an important part of the Digital India Initiative of the Government and will contribute in further development of the villages.

Key Features of GARV App

- Using this app, use can know that which village will be electrified next.
- You can see the total electrified or un-electrified villages on dashboard.
- You can also check the progress status of any village.

7. mPassport Seva App

It is a easy to use app that provides all the functions as available over the Passport Seva Portal such as New User Registration, existing user login etc.

This app was launched on the occasion of Sixth Passport Seva Divas on 26th June, 2018. mPassport Seva app is available in Android and iOS platforms and will have the facilities to apply, pay and schedule appointments for passport services.

Key Features of mPassport Seva App

- Users are able to search for a Passport Seva Kendra or District passport cell.
- mPassport Seva app lets you check both passport application status and RTI status.
- Document advisor helps the user to find out the required documents they need to carry while visiting passport office for application submission.

8. OnlineRTI

RTI India has launched a mobile application for Android phones. This application works as a cross between a social networking site and a RTI encyclopedic help book.

Key Features of OnlineRTI

- Basic objective of this app is to empower the citizens, promote transparency and accountability in the working of Government.
- To secure access the information under the control of public authorities.
- It preserves the confidentiality of sensitive information.

9. Voter Helpline App

This app provides the convenience to all the people for finding their names in the electoral roll, submitting online forms, checking status of the application, filling complaints and receiving the reply. Voter helpline app was launched in February 2019. The main objective of this app is to motivate and educate voters.

Key Features of Voter Helpline App

- It provides a single point of service and information delivery to voters across the country.
- You can search for your name by in Electoral Roll by EPIC Number or barcode of EPIC card.
- Voter can register to vote for new voter registration.

Model Questions

Multiple Choice Questions

Select the appropriate answer the choices given below.

1. The basic functions of a computer system are to accept the input, process the input, output and to
   (a) digital form (b) memory
   (c) store data (d) compute
2. ..... is a command given to a computer in the computer language by the user.
   (a) Instruction
   (b) Information
   (c) Program
   (d) Data
3. Which generation of computer is covered by the period 1964-71?
   (a) First (b) Second
   (c) Third (d) Fourth
4. In third generation, ... were used.
   (a) Vacuum tubes
   (b) Integrated circuits
   (c) Transistors
   (d) Large scale integrated circuits
5. Speed of third generation computers was measured in
   (a) millisecond (b) microsecond
   (c) nanosecond (d) picosecond
6. PCs are considered fourth generation and contain
   (a) information (b) data
   (c) vacuum tubes (d) microprocessors
7. Artificial intelligence is an example of
   (a) first generation computer
   (b) second generation computer
   (c) fourth generation computer
   (d) fifth generation computer
8. Laptops are
   (a) computers used in clinical laboratories
   (b) portable, light weight and can be fit into briefcase
   (c) hearing voice recognition system
   (d) desktop
9. A ..... is a large and expensive computer capable of performing scientific and business applications.
   (a) Super computer
   (b) Mainframe computer
   (c) Mini computer
   (d) Handheld computer
10. Analog computer works on the supply of
    (a) continuous electrical pulses
    (b) electrical pulses but not continue
    (c) magnetic strength
    (d) physical strength
11. Seismograph is an example of
    (a) Analog computer (b) Digital computer
    (c) Hybrid computer (d) All of these
12. The presence of computers can be seen in
    (a) education (b) banking
    (c) multimedia (d) All of these
13. Pointing device includes the following except
    (a) mouse (b) touch screen
    (c) trackball (d) keyboard
14. A joystick is primarily used to
    (a) control sound on the screen
    (b) computer gaming
    (c) enter text
    (d) draw pictures
15. A device, which is used for making drawings, graphics and for menu selection.
    (a) Keyboard (b) Mouse
    (c) Touch Screen (d) Light Pen
16. A device that makes copies and reproduces text and images is called
    (a) CPU (b) memory
    (c) printer (d) scanner
17. In abbreviation MICR, C stands for
    (a) Code (b) Color
    (c) Computer (d) Character

18. A barcode reader is an example of
(a) processing device (b) storage device
(c) input device (d) output device

19. What type of device is a digital camera?
(a) Input (b) Output
(c) Software (d) Storage

20. What is the function of an output device?
(a) To send data to the computer
(b) To store data
(c) To give output to the user
(d) To do mathematical calculations

21. The output devices make it possible to
(a) view or print data (b) store data
(c) scan data (d) None of these

22. Which type of printer cannot produce high quality print graphics?
(a) Daisy wheel printer
(b) Laser printer
(c) Line printer
(d) Chain printer

23. Which of the following produces high quality output?
(a) Impact printer (b) Non-impact printer
(c) Both (a) and (b) (d) Plotter

24. Resolution of laser printer is specified in terms of
(a) DPI (b) LPM
(c) CPM (d) PPM

25. Which of the following is an output device?
(a) Keyboard (b) Biometric Sensor
(c) Trackball (d) Plotter

26. Which of the following is a part of CPU?
(a) ALU (b) Control unit
(c) Both (a) and (b) (d) Disk drive

27. Arithmetic operations in ALU performs
(a) addition (b) subtraction
(c) multiplication (d) All of these

28. Arithmetic logic unit and control unit sections have special purpose location called
(a) registers (b) RAM
(c) BIOS (d) I/O

29. Which of the following is the magnetic storage device?
(a) Hard disk (b) Compact disc
(c) Audio tapes (d) All of these

30. Which of the following storage media provides sequential access only?
(a) Floppy disk
(b) Magnetic disk
(c) Magnetic tape
(d) Optical disc

31. Which one is a secondary storage device?
(a) CD-ROM
(b) RAM
(c) Both (a) and (b)
(d) None of the above

32. ..... is the smallest memory measurement unit.
(a) Bit (b) Nibble
(c) Byte (d) Mega

33. 1 Mega byte is equal to
(a) 1000 KB (b) 1026 KB
(c) 1024 KB (d) 1000 KB

34. What is the name given to Input-Output devices and external storage media together?
(a) Hardware (b) Peripherals
(c) Software (d) Control unit

35. The part of software are
(a) word processing and spreadsheet
(b) transaction and application
(c) windows and Mac OS
(d) system and application

36. Which of the following is not a system software?
(a) Operating system (b) Compiler
(c) Interpreter (d) MS-Office

37. Operating system is a
(a) application software
(b) system software
(c) hardware
(d) language

38. Translator program used in assembly language is called
(a) compiler (b) interpreter
(c) assembler (d) translator

39. Which type of software is designed to perform specific, personal, business or scientific processing tasks?
(a) System (b) Application
(c) GUI (d) Compiler

40. It is a set of instructions or programs designed for specific use or application that enable the user to interact with a computer are called
(a) application software
(b) operating system
(c) instructions
(d) system unit

41. Utility programs include
(a) Virus scanning software
(b) Backup software
(c) Disk fragmenter
(d) All of the above

42. Which of the following software is any computer software that is distributed with its source code available for modification?
(a) Application software
(b) System software
(c) Open source software
(d) Proprietary software

43. Example(s) of open source software is/are
(a) Linux (b) Unix
(c) MySQL (d) All of these

44. This software is copyrighted and bears the limits against use.
(a) Proprietary software
(b) Open source software
(c) Application software
(d) System software

45. ..... is a device that has a specific function in addition usually has small dimensions.
(a) Software (b) Gadget
(c) Keyboard (d) Scanner

46. Which of the following is/are IT gadget?
(a) Keyboard (b) Wrist watch
(c) Smart watch (d) Joystick

47. Smart band is also known as
(a) Smart bracelets
(b) Connected bracelets
(c) Both (a) and (b)
(d) Smart watch

48. Which of the following is a wearable computing device which comes with a head mounted display in the form of eyeglasses?
(a) Google glass (b) Drone camera
(c) Spy pen (d) Smart goggle

49. This IT gadget is used for protection, safety and even investigation.
(a) Drone camera (b) Smart watch
(c) Bluetooth speaker (d) Spy pen

50. BHIM app is used to make simple, easy and quick payment transactions using
(a) Password (b) UPI
(c) Phone number (d) Aadhar number

51. App launched by IRCTC was known as
(a) IRCTC Connect (b) IRCTC App
(c) IRCTC Launcher (d) IRCTC Booking

52. Paytm is India's largest mobile payment and commerce platform founded by
(a) Aditya Sharma
(b) Vijay Shekhar Sharma
(c) Sidhartha Sharma
(d) Shekhar Verma

53. This mobile app reduces the use of physical documents and fake documents. What is this?
(a) GARV app
(b) DigiLocker app
(c) MyGov app
(d) OnlineRTI app

54. RTI India has launched a mobile application for ..... phones.
(a) Android (b) Apple
(c) Symbian (d) BlackBerry

True/False

Identify True/False from the following statements.

55. Instruction is a command given to a computer in the computer language by the user.

56. Information is a set of instructions given to a computer.

57. The first generation computers could not do multitasking.

58. NCR 304, IBM-1401 are the examples of second generation computer.

59. The main characteristics of fourth generation was vacuum tubes.

60. A scanner, trackball and joystick are examples of output devices.

61. OCR is a device that scans written or typed text and transforms it into computer readable form.

62. A mic converts the received sound into computer's format.

63. Output devices store instructions or data that the CPU process.

64. The number of pixels displayed on a screen is known as resolution.

65. In a CRT, an electron gun is used, which fires electrons at groups of phosphor dots coating the inside of the screen.

66. When a computer prints a report, this output is called hard copy.

67. A plotter is used to generate the map of building and shopping malls.

68. Antivirus software is used to allocate the memory to the data.

69. Open source software must be available free or at a low cost.

70. Licenses and maintenance of proprietary software are very cheap.

71. Smart bands have a pedometer and sometimes also an optical heart rate sensor.

72. Google glass is powered by Android mobile operating system.

73. Drone camera is an example of mobile app.

74. The aim to launch the BHIM app to make cashless payments.

75. MyGov app is used to store all official documents.

76. Helpline app provides a single point of service and information delivery to voters across the country.

Answers

1. (c)	2. (a)	3. (c)	4. (b)	5. (c)	6. (d)	7. (d)	8. (b)	9. (a)	10. (a)
11. (a)	12. (d)	13. (d)	14. (b)	15. (d)	16. (d)	17. (d)	18. (c)	19. (a)	20. (c)
21. (a)	22. (d)	23. (b)	24. (a)	25. (d)	26. (c)	27. (d)	28. (a)	29. (a)	30. (c)
31. (a)	32. (a)	33. (c)	34. (b)	35. (d)	36. (d)	37. (b)	38. (c)	39. (b)	40. (a)
41. (d)	42. (c)	43. (d)	44. (a)	45. (b)	46. (c)	47. (c)	48. (a)	49. (d)	50. (b)
51. (a)	52. (b)	53. (b)	54. (a)	55. True	56. False	57. True	58. True	59. False	60. False
61. True	62. True	63. False	64. True	65. True	66. True	67. True	68. False	69. True	70. False
71. True	72. True	73. False	74. True	75. False	76. True				