

② What is computer and explain the component of computer ?

→ A computer is an electronic machine that can solve different problems, process data, stores and retrieve data and perform calculations faster and efficiently than humans.

* The following components of computers —

The basic component of digital computers are Input device, output device, central processor unit (CPU), mass storage device and memory.

The output device of computers such as monitor, printer, speaker etc.

* Five basic component of computer system —

- Input unit
- Output unit
- Storage unit
- central processing unit (CPU)
- Arithmetic and Logic unit (ALU)
- control unit

Input -

Input is the raw information entered into a computer from the input devices. It is the collection of letters, numbers, images etc.

Output -

Output is the processed data given by computer after data processing.

storage unit -

It contains primary storage and secondary storage. It stores the information.

central processing unit -

- It contains the indication flow of instruction and data.

Arithmetic and Logic unit -

- It indicates the control exercised by the control unit.

control unit -

It is the component of computer central processing unit that directs the operation of the processor.

③ Define computer, types of computer & characteristics of computer?

→ A computer is an electronic machine that can solve different problems, process data, stores and retrieve data and perform calculations faster and efficiently than human.

* The following types of computers - :

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The following types of computer -

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- ① Analog computer -
- ② Digital computer -
- ③ Hybrid computer -

Analog computer -

An Analog computer is a form of computer that uses continuous physical phenomena such as electrical, mechanical or hydraulic quantities to model the problem being solved.

Digital computer -

A computer that refers to perform the calculation & logical operation with quantities represented as digit, usually in the binary number system.

* The following characteristic of computers -

- 1) Speed
- 2) Accuracy
- 3) Diligence
- 4) Versatility
- 5) Power of Remembering
- 6) No IQ
- 7) No feeling
- 8) Storage

Speed -

As you know computer can work very fast. It take only few sec. for calculations that we take hours to complete.

2. Accuracy -

The degree of accuracy of computer is very high and every calculation is performed with the same accuracy. The accuracy level is 7. determined on the basis of design of computer.

3. Diligence -

A computer is free from tiredness, lack of concentration, fatigue etc. It can work for hours without creating any error.

4. Versatility -

It means the capacity to perform completely different type of work. You may use your computer to prepare payroll slips. Next moment you may use it for inventory management or to prepare electric bills.

5. Power of Remembering -

It stores any amount of data or information. Any information can be stored and recalled as long as you require it for any number of years. It depends upon the data when to lose or retrieve these data.

6. No IQ -

It is dumb machine and it cannot do any work without instructions from the user.

7. No. Feeling -

It does not have feeling or emotions, taste, knowledge and experience. It does not distinguish between users.

8. Storage -

The computer has in-built memory it can store large amount of data. You can store the data with the help of storage device such as floppies etc.

(4) What is hardware & explain the type of hardware.

Hardware is the collection of all the parts you can physically touch such as monitor, keyboard and mouse etc.

→ The following types of hardware -

1) CPU is responsible for processing most of computer's data, turning input into output.

2. memory consists of computer chips that hold data.
3. Hard drive stores software.
4. In addition to the components in the system unit a computer may come with one or more input device.
5. Each computer has some type of display screen.
6. Most desktop & notebook computer come with an optical drive, which is a drive that will read CD's, DVD's and Blu-ray discs.
7. Whatever computer you have, you will probably want to use it to connect to the Internet.

* CPU is responsible for processing most of the computer's data, turning input into output.

- A CPU is a very small, thin silicon wafer that is encased in a ceramic chip.
- CPU speed is measured in gigahertz (GHz).
- The higher this measurement, the faster the CPU can operate.
- A hertz is a cycle per sec; a gigahertz is 1 billion cycles per sec.
- A fairer comparison betⁿ two diffⁿ CPUs is the no. of instruction per sec they can perform.

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* Hard drive stores software -

- When the computer is turned off, whatever is on the hard drive remains there, so you don't have to reload software every time to reload the turns on the computer.
- Most hard drive sold today are the traditional mechanical type that use metal platters to store data with magnetic polarity, but a newer type called a solid state hard drive (SSHD)

* Each computer has some type of display screen -

- Depending on the type of computer the display screen may be built-in or may be separate unit called a monitor or with its own power cord, as shown.
- Some displays are touchscreen, so you can use your finger on the screen to provide input to the computer.

5) What is software? explain types of computer?

software defined as a set of instructions given to the computer.

The following types of software.

- 1) system software
- 2) Application software

1) System software -

- The system software is a collection of programs designed to operate, control and extend the processing capabilities of the computer itself.
- system software is generally prepared by computer manufacturers. These software products comprise of programs written in low-level language, which interact with the hardware at a very basic level.
- System software serves as the interface betⁿ the hardware and end users.
- The example of system softwares are operating system, compilers, Interpreter, Assemblers etc.

2) Application software -

- Application software products are designed to satisfy a particular need of a particular environment.

- All software applications prepared in the computer lab can come under the category of application software.

- Application software may consist of a single program, such as Microsoft's notepad for writing and editing a simple text.

- It may also consist of a collection of programmes, which work together to accomplish a task, such as a spreadsheet package.

⑤ Define Hardware, software & firmware.

→ ① Hardware - physical parts of the computer are called hardware.

② Software - A set of instructions given to the computer is called software.

③ Firmware - Firmware is a software program or set of instructions programmed on a hardware device.

Firmware is software that is embedded in a piece of hardware.

① Write short note on fireware.

- fireware is software that is embedded in a piece of hardware.
- It provides the necessary instructions for how the device communicates with the other computer hardware.
- fireware is typically stored in the flash ROM of a hardware device.

There are levels of fireware.

① Low Level fireware -

This is found in ROM, OTP / PROM and PLA structures. Low level fireware is often read only memory and cannot be changed or updated.

② High Level fireware -

This is used in flash memory for updates that is often considered as software.

③ subsystems -

These have their own fixed microcode embedded in flash chips, CPUs and LCD units. A subsystem is usually considered part of the hardware device as well as high level fireware.

③ What is data representation and explain Binary numbers system with example.

→ Binary number system -

- In binary number system, the value of base is 2. Hence it has only two symbols or digit (0 and 1) the largest single digit being 1.
- Each position in a binary number represents a power of the base (2). Hence, in this system the rightmost position is units (2^0) position, the second position from the right is 2's (2^1) position and proceeding in this way, we have 4's (2^2) position, 8's (2^3) position, 16's (2^4) position and so on.

for example -

Decimal equivalent of binary number 10101 (written as 10101_2) is

$$= (1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$$

$$= 16 + 0 + 4 + 0 + 1$$

$$= 21$$

In order to the specific about which system we are referring to it is a common practice to indicate

the base as a subscript. Hence we write $101012 = 2110$

- Bit is the short form of "binary digit". Hence a "bit" in computer terminology means either a 0 or 1.

- An n-bit number is a binary number consisting of 'n' bits.

* Method for Binary to Octal conversion.

Step-1 - Divide the binary digit into groups of three.

Step-2 - Convert each group of three binary digit to one octal digit.

ex. $1011102 = 98$

Step: I - Divide the binary digits into groups of 3 (LSD) starting from

101110

Step-II - Convert each group into one digit of octal

$$\begin{aligned} 1012 &= 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\ &= 4 + 0 + 1 \\ &= 58 \end{aligned}$$

$$\begin{aligned} 1102 &= 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 \\ &= 4 + 2 + 0 \\ &= 68 \end{aligned}$$

Hence $1011102 = 568$

9) convert Binary no. system to Hexa-decimal.

It contain the following steps.

Step-I -

Divide the binary digits into groups of four (starting from the right)

Step-2

convert each group of four binary digits to one hexadecimal digit. Remember that hexadecimal digits 0 to 9 are equal to decimal digits 0 to 9 and hexadecimal digits A to F are equal to decimal values 10 to 15. Hence, for this steps, we use binary to decimal conversion procedure and represent decimal values 10 to 15 as hexadecimal A to F.

$1101000112 = 916$

Step-I

Divide binary digit in group of 4

1101 0011

Step-II

convert each group of 4 binary digits to 1 hexadecimal digit

$$\begin{aligned} 1101_2 &= 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\ &= 8 + 4 + 0 + 1 \\ &= 13_{10} \\ &= D_{16} \end{aligned}$$

Hence = ~~11010011₂ D3~~

$$\begin{aligned} 0011_2 &= 0 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 \\ &= 0 + 0 + 2 + 1 \\ &= 3_{10} \end{aligned}$$

Hence, $11010011_2 = D3_{16}$

(10) Convert Hexadecimal to Binary no. system -

It contains following steps -

Step - I

convert decimal equivalent of each hexadecimal digit to 4 binary digits

Step - II

combine all resulting binary group into a single binary number.

EX $2AB_{16} = ?_2$

Step - I convert the decimal equivalent of each hexadecimal digit to 4 binary digits.

$$2_{10} = 2_{10} = 0010_2$$

$$A_{16} = 10_{10} = 1010_2$$

$$B_{16} = 11_{10} = 1011_2$$

Step-2

combine the binary groups

$$2AB_{16} = \frac{0010}{2} \quad \frac{1010}{2} \quad \frac{1011}{2}$$

Hence $2AB_{16} = 0010101011_2$

② $ABC_{16} = ?_2$

→ $ABC_{16} = \frac{1010}{A} \quad \frac{1011}{B} \quad \frac{1100}{C}$

$= 101010111100_2$

Hence $ABC_{16} = 101010111100_2$

⑪ Distinguish between ASCII and unicode.

ASCII

- ASCII is the American standard code for Information Interchange.

Unicode

It doing all kinds of data processing of the world, their usage could be limited to english language users only

15) Explain Input & output device?

→ Input Devices -

- 1) Keyboard Device
- 2) Point and Draw Device (mouse) (trackball)
- 3) Data scanning device
- 4) Digitizer
- 5) Electronic cards based device
- 6) Speech recognition device
- 7) vision based device.

Output Device -

- 1) monitors
- 2) Printers
- 3) Plotters
- 4) Screen image projector
- 5) Voice Response system.

1) Keyboard Device -

- It allow data entry into a computer system by pressing a set of keys neatly mounted on a keyboard connected to a computer system.
- The most popular keyboard used today is the 101-keys QWERTY keyboard.

2) Point & Draw Device -

- mouse is the most popular point and draw device.

- It must have input device on modern personal computers and workstations because they support GUI as their primary user interface.
- A mouse is a small hand-held device that fits comfortably in a user's palm.
- It rolls on a small bearing and has one or more buttons on the top.
- It is easy to open any icon in the screen.

3) Data scanning device -

It allows data entry from source documents directly. It has the following characters

- They eliminate the need for manual entry of data by human beings, thus improving data accuracy and timeliness of data processing.
- Automatic entry of data with their use improves data accuracy and increases timeliness of the data processing information processed.
- It contains the following devices such as:
 - 1) Image scanner
 - Flatbed scanner
 - Hand-held scanner
 - 2) Optical character Recognition (OCR) Device
 - 3) Optical mark Reader (OMR)
 - 4) Bar-code Reader
 - 5) Magnetic Ink character Recognition (MICR)

Output Device -1) Monitors -

- Monitors are the most popular soft-copy output device used today.
- They display an output on a television like screen.
- A monitor attached to the keyboard and together they form a video display terminal (VDT).
- A user uses the input data using keyboard & uses the output data using monitors with the screen.
- The two types of monitors
 - 1) Cathode-ray-tube (CRT)
 - 2) Liquid crystal display (LCD)
- LCD is the flat panel monitor and is thinner, lighter and suitable for use with both portable & non-portable computer. It consumes less power supply & occupies less table space.

2) Printers -

Printers are the most popular hard-copy output device used today.

Different types of printers such as

- 1) Dot-matrix Printers
- 2) Inkjet Printers
- 3) Drum Printers
- 4) Chain / Band printers
- 5) Laser printers

- Inkjet Printers are character printers that forms the character and images by spraying small drops of ink on a paper.
- The print head of an inkjet printer contains up to 64 tiny nozzles.
- The printer can heat up the nozzle selectively in a few micro-seconds by an integrated circuit resistor.

3) Plotters -

- Drum plotter
- Flatbed Plotter

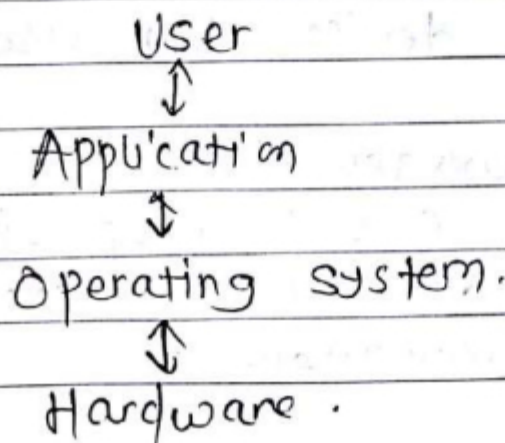
4) Voice Response System -

- Voice Reproduction system
- speech synthesizer

15) What is Operating System ? Explain in detail.

→ Operating system -

Operating system (OS) is system software that manage computer hardware and software resource and provide common service for computer programs.



* Objectives of operating system —

- 1) Convenience
- 2) Efficiency
- 3) Ability to evolve —

- convenience makes computer users friendly

- efficiency allows computer to use resources efficiently.

* Function of operating system —

- 1) Resource management
- 2) Process management
- 3) memory management
- 4) storage management
- 5) Device management
- 6) Data management
- 7) Job management
- 8) Standard means of communication betⁿ users & computers

* Resource management —

The resource management function of an OS allocates computer resources such as CPU times, main memory, secondary storage and input & output device for use.

* Process management —

The O.S is responsible for the following activities in connection with process management

- i) creating and deleting both users & system processes
- ii) Suspending & resuming process
- iii) Providing mechanisms for process synchronization
- iv) Providing mechanism for process communication.
- v) Providing mechanism for deadlock handling.

(17) Define O.S and type of O.S with example.

→ An Operating system is system software that manages computer hardware & software resources and provides common service for computer programs.

The following types of O.S

- 1) Batch operating system
- 2) Time-sharing operating system
- 3) Distributed operating system
- 4) Network operating system
- 5) Real-time operating system
- 6) - Hard real time operating system
- 7) - Soft real time system

* Batch operating system -

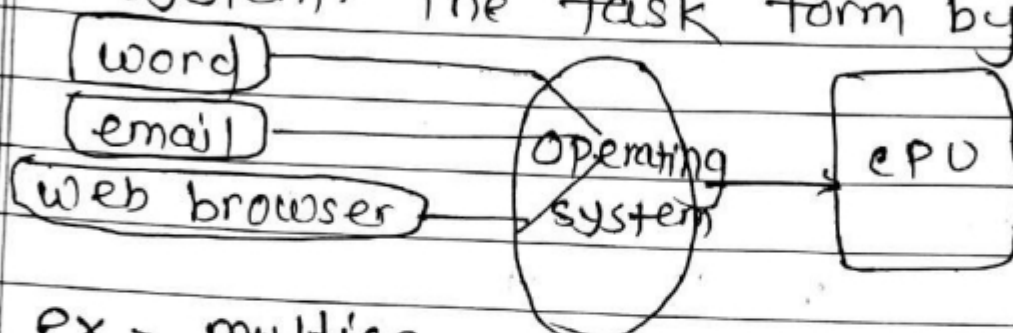
- This type of O.S do not interact with computer directly.
- multiple users can share the batch system.
- The idle time batch system is very less.

- It is easy to manage large work repeatedly in batch system

ex - payroll system, Bank statement etc

2. Time-sharing O.S -

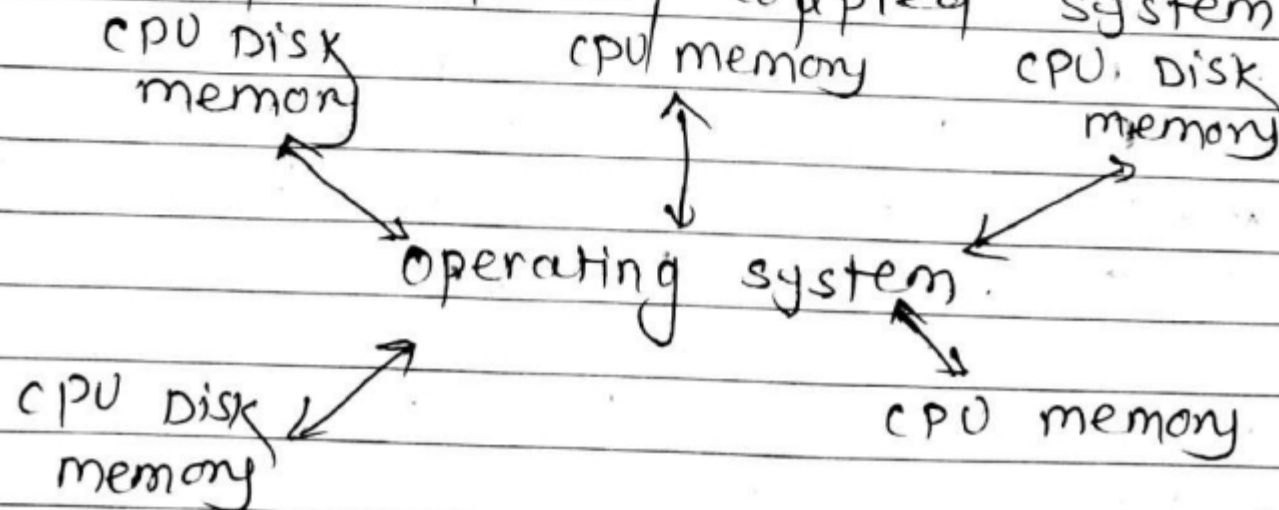
Each user gets time of CPU as they use single system. These system is also known as multitasking system. The task form by users.



ex - multics, unix etc

3. Distributed O.S -

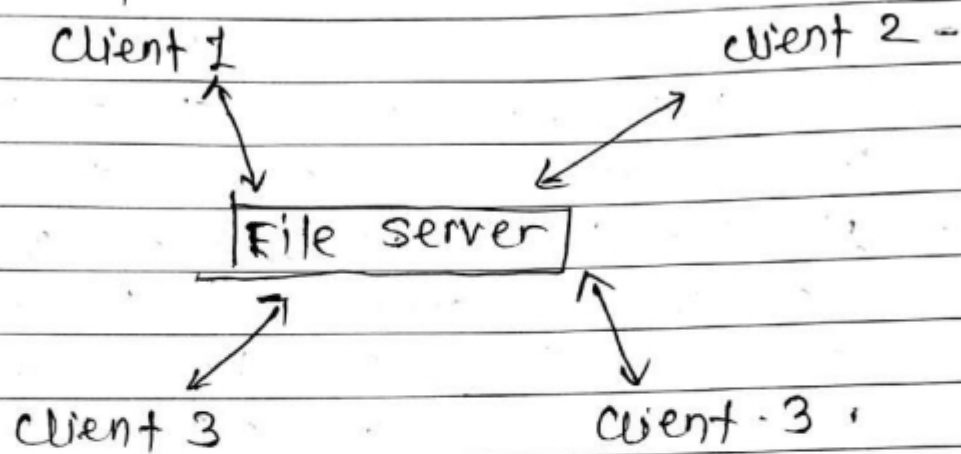
In these system autonomous inter-connected computers communicate each other using shared network. These referred as loosely coupled system.



ex - LOCUS etc.

4. Network O.S -

These system runs on a server and provides the capability to manage data, users, groups, security application and other networking function. These type of o.s contain allow shared access - files, printers networking functions etc.



ex - microsoft windows server 2003
microsoft windows server 2008

UNIX

Linux

Mac O.SX, Novell Netware { BSD

5. Real-time O.S -

Real time system used when there are time requirement are very strict. like missile system, air traffic control system robots etc. Two types of Real-time o.s such as

- Hard Real time system
- Soft Real time system

ex - scientific experiment, industrial control system
weapon system, medical imaging system etc

(18)

What is relationship betⁿ o.s and Hardware.

→ The following Relationship betⁿ o.s and Hardware.

- o.s is system software that manage computer hardware & software resources & provides common services for computer programs.
- The o.s is also responsible for security, ensuring that unauthorized users do not access the system.
- It handles input and output to and from attached hardware device, such as hard disks, printers and dial-up ports.
- It send messages to each application or interactive users about the status of operation and any error that may have occurred.
- Physical part of computer are called hardware.
- You can touch, see & feel hardware.
- User cannot make new duplicate copies of hardware.
- Hardware cannot be transferred from one place to another electronically through network.

