Branch: information system

Principle of Information System

2023-2024

Computer fundamental INTRODUCTION TO COMPUTER

Microsoft account
SACC

Computer fundamental
INTRODUCTION TO COMPUTER

1. WHAT IS COMPUTER?

2. • **The word "computer" is comes from the word "TO COMPUTE" means to calculate.**
3. • **A computer is normally considered to be a calculation device which can perform the arithmetic operations very speedily.**
4. • **A computer may be defined as a device which operates upon the data.**
5. • **Data can be in the form of numbers, letters, symbols, size etc. And it comes in various shapes & sizes depending upon the type of computer application.**

<u>A computer can store, process & retrieve data as and when we desired.</u>

- **The fact that computer process data is so fundamental that many people have started calling as "Data Processor".**
- **A computer first it gets the Data, does Process on it and then produces Information**.

DEFINATION OF COMPUTER

- A computer is an electronic device which takes input from the user, processes it and gives the output as per user's requirement.
- So the main tasks of performed by the computer are:
  - **Input**
  - **Process**
  - **Output**

2. WRITE DOWN THE CHARACTERISTICS OF COMPUTER

Some important characteristics of the computer are as follow:

Automatic:

- **Computers are automatic machines because it works by itself without Human intervention.**
- **Once it started on a job they carry on until the job is finished.**
- **Computer cannot start themselves.**
- **They can works from the instructions which are stored inside the system in the form of programs which specify how a particular job is to be done.**

Accuracy:

- **The accuracy of a computer is very high.**
- **The degree of accuracy of a particular computer depends upon its design.**
- **Errors can occur by the computer. But these are due to human weakness, due to incorrect data, but not due to the technological weakness.**

Speed:

- **Computer is a very fact device. It can perform the amount of work in few Seconds for which a human can take an entire year.**
- **While talking about computer speed we do not talk in terms of seconds**

and milliseconds but in <u>microseconds</u>.

- **A powerful computer is capable of performing several billion (109) simple Arithmetic operations per second.**

<u>Diligence:</u>

- **Unlike human beings, a computer is free from monotony, tiredness & lack of concentration.**
- **It can continuously work for hours without creating any error & without grumbling.**
- **If you give ten million calculations to performed, it will perform with Exactly the same accuracy & speed as the first one.**

<u>Power of remembering:</u>

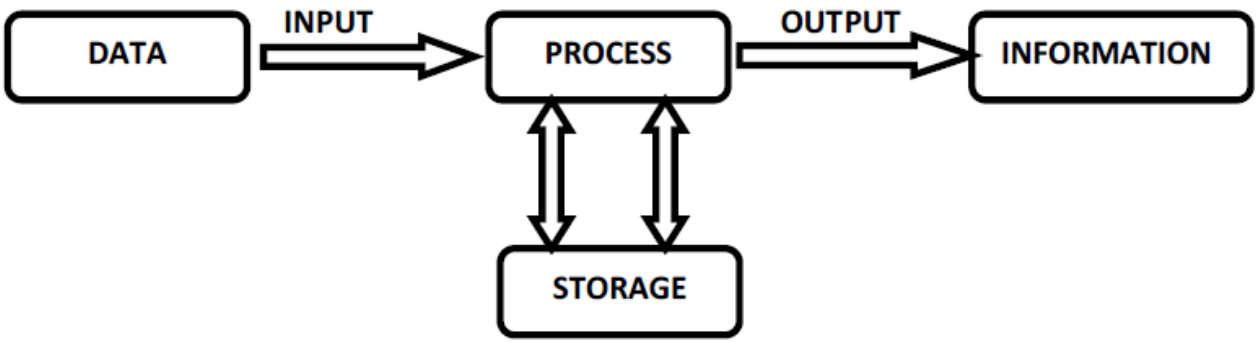
- **Computer can store and recall any amount of data because of its high Storage capacity of its storage devices.**
- **Every piece of information can be retained as long as desired by the user And can be recalled as and when required.**
- **Even after several years, if the information recalled, it will be as accurate As on the day when it was filled to the computers.**

3.EXPLAIN THE DATA PROCESSING CYCLE OF COMPUTER.

- **The computer Data Processing is any process that a computer program does to enter data & summarise, analyse or convert data into useable information.**
- **The process may be automated & run on a computer.**
- **It involves recording, analysing, storing, summarising & storing data.**
- **Because data are most useful when it is well presented & informative**

The Data Processing Cycle:

- **Data Processing cycle described all activities which are common to all data processing systems from manual to electronic systems.**
- **These activities can be grouped in four functional categories, viz., data input, data processing, data output and storage, constituting what is known as a data processing cycle.**
- **The main aim of data processing cycle is to convert the data into meaningful information.**
- **Data processing system are often referred to as Information System.**
- **The Information System typically take raw Data as Input to produce Information as Output.**



The data processing cycle contains main four functions:

- **Data input**
- **Data process**
- **Data storage**
- **Data output**

- **DATA INPUT**
  - **The term input refers to the activities required to record data.**
  - **It's a process to entered data in to computer system.**
  - **So before we input any data, it is necessary to check or verify the data context.**

- **DATA PROCESSING**

❖ **The term processing includes the activities like classifying, storing, calculating, comparing or summarising the data.**

❖ **The processing means to use techniques to convert the data into meaningful information.**

- **<u>DATA OUTPUT</u>**

❖ **It's a communication function which transmits the information to the outside world.**

❖ **After completed the process the data are converted into the meaningful in**

❖ **Sometimes the output also includes the decoding activity which converts the electronically generated information into human readable form.**

- **<u>DATA STORAGE</u>**

❖ **It involves the filling of data & information for future use.**

4.EXPLAIN THE CLASSIFICATION OF THE COMPUTER BY DATA PROCESSED

The computers are divided mainly three types on the based on data processed:

1. **Analog computers**
2. **Digital computers**
3. **Hybrid computers**

Analog computers:

❖ **In Analog Computers, data is represented as continuously varying voltage and operate essentially by measuring rather counting.**

❖ **As the data is continuously variable, the results obtained are estimated and not exactly repeatable.**

❖ **It can able to perform multiple tasks simultaneously and also capable to work**

effectively with the irrational number. E.g. 1/8 = 0.125 and 1/6=0.1666

- **Voltage, temperature and pressure are measured using analog devices like voltmeters, thermometers and barometers**.

Digital Computers

- **The digit computer is a machine based on digital technology which represents information by numerical digit.**
- **In Digital Computers data is represented as discrete units of electrical pulses. The data is measured in quantities represented as either the 'on' or 'off' state.**
- **Therefore, the results obtained from a digital computer are accurate.**
- **Virtually all of today's computers are based on digital computers.**

Hybrid Computers

- **It combines the good features of both analog & digital computers.**
- **It has a speed of analog computer & accuracy of digital computer.**
- **Hybrid Computers accept data in analog form and present output also in Digitally.**
- **The data however is processed digitally.**
- **Therefore, hybrid computers require analog-to-digital and digital-to-analog converters for output**.

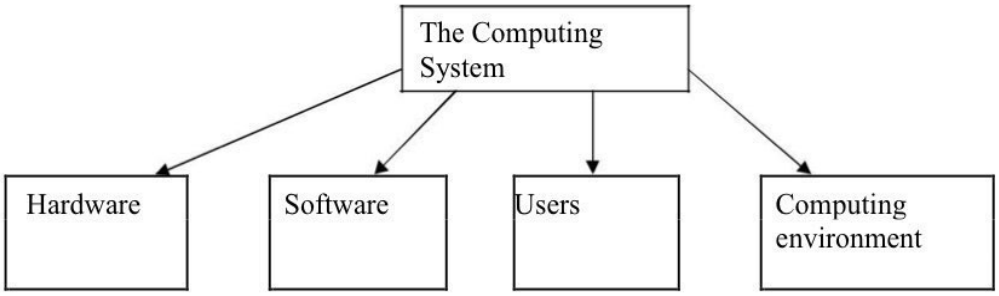


Fig. 1.2a: Schematic diagram of the computing system

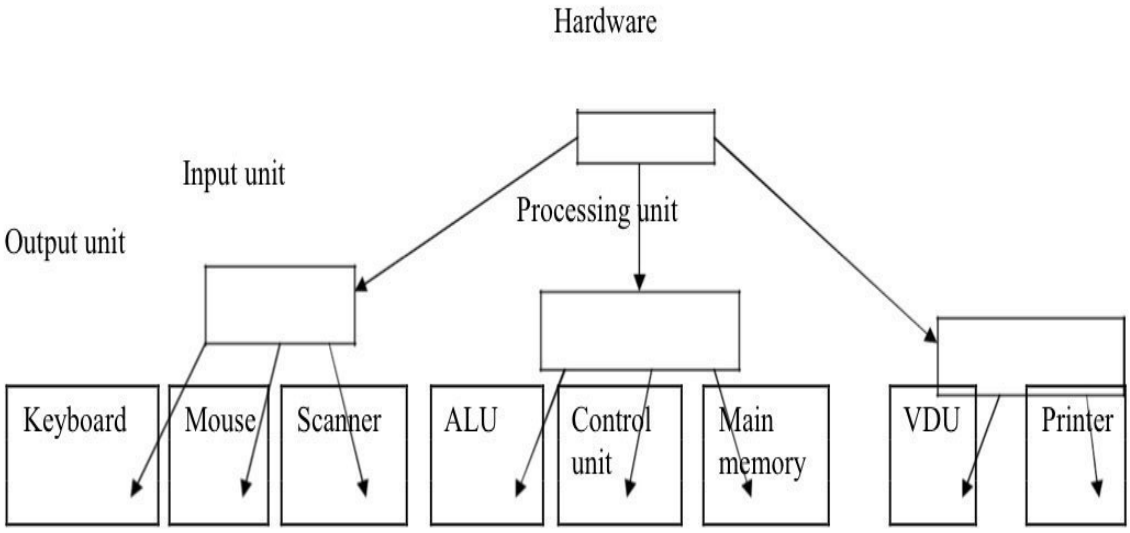


Fig. 1.2b: Computer hardware

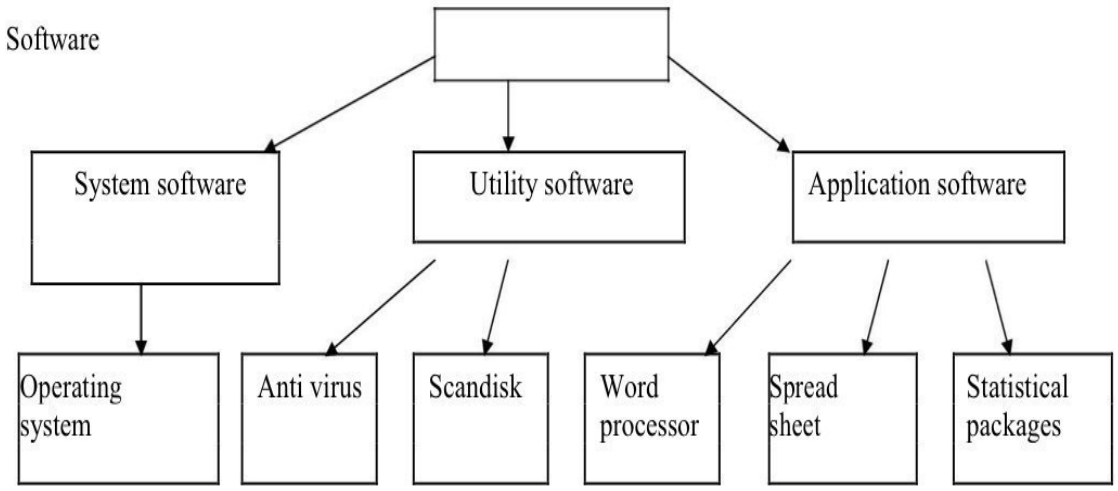


Fig. 1.2c: Computer software

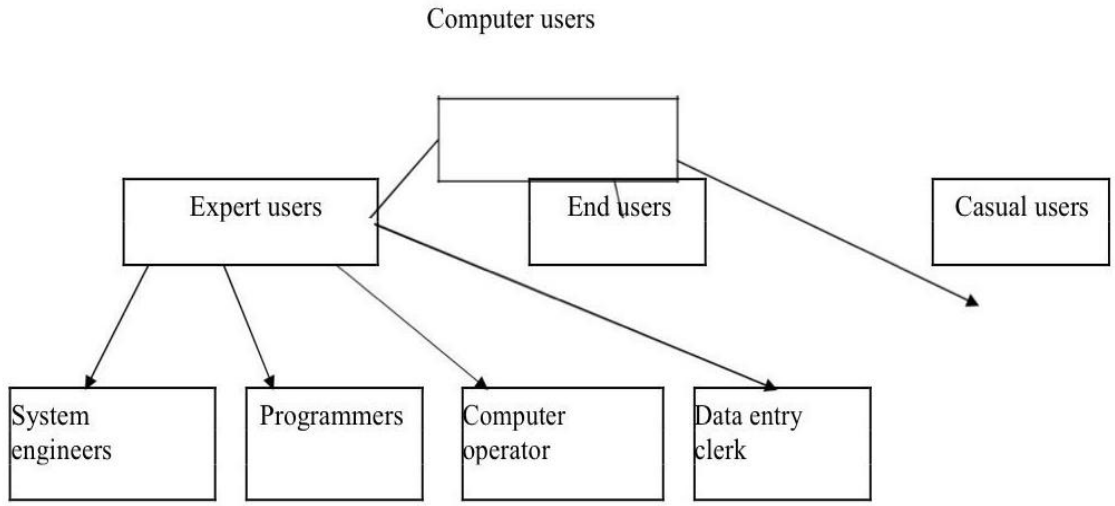


Fig. 1.2d: Computer users

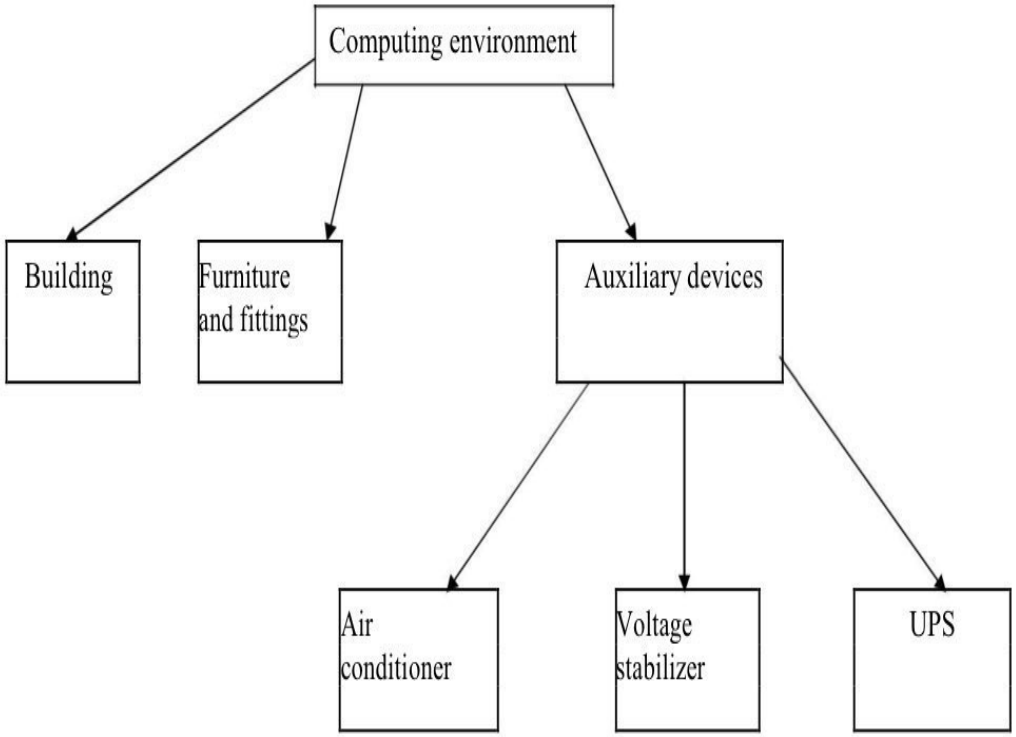


Fig. 1.2e: Computing environment

5.EXPLAIN THE CLASSIFICATION OF THE COMPUTER BY DATA PROCESSING:

The computers are classified in four types on the based on data processing.

- **Micro computer**
- **Mini computer**
- **Mainframe computer**
- **Super computer**

Micro Computer:

- **Micro computers are the computers with having a microprocessor chip as it central processing unit.**
- **Originated in late 1970s.**
- **First microcomputer was built with 8 bit processor.**
- **Microcomputer is known as personal computer.**
- **Designed to use by individual whether in the form of pc's, workstation or notebook computers.**
- **Small in size and affordable for general people.**
- **Ex: IBM PC, IBM PC/XT, IBM PC/AT**

Mini computer

- **Mini computers are originated in 1960s.**
- **Small mainframes that perform limited tasks.**
- **Less expensive than mainframe computer.**
- **Mini computers are Lower mainframe in the terms of processing capabilities.**

- **Capable of supporting 10 to 100 users simultaneously.**
- **In 1970s it contains 8 bit or 12 bit processor.**
- **Gradually the architecture requirement is grown and 16 and 32 bit.**
- **Minicomputers are invented which are known as supermini computers.**
- **Ex: IBM AS400**

Mainframe Computer:

- **A very powerful computer which capable of supporting thousands of user simultaneously.**
- **It contains powerful data processing system.**
- **It is capable to run multiple operating systems.**
- **It is capable to process 100 million instructions per second.**
- **Mainframes are very large & expensive computers with having larger internal storage capacity & high processing speed**
- **Mainframes are used in the organization that need to process large number of transaction online & required a computer system having massive storage & processing capabilities.**
- **Mainly used to handle bulk of data & information for processing.**
- **Mainframe system is housed in a central location with several user terminal connected to it.**
- **Much bigger in size & needs a large rooms with closely humidity & Temperature.**
- **IBM & DEC are major vendors of mainframes.**
- **Ex: MEDHA, SPERRY, IBM, DEC, HP, HCL**

- **Most powerful & most expensive computer.**
- **Used for complex scientific application that requires huge processing power.**
- **Used multiprocessor technology to perform the calculation very speedy.**
- **They are special purpose computers that are designed to perform some Specific task.**
- **The cost of the super computer is depended on its processing capabilities & configuration.**
- **The speed of modern computer is measured in gigaflops, teraflops and petaflops.**
  - **Gigaflops= 109 arithmetic operation per second.**
  - **Teraflops=1012 arithmetic operation per second.**
  - **Petaflops=1015 arithmetic operation per second.**

6. EXPLAIN THE GENERATION OF THE COMPUTERS.

In Computer language, "Generation" is a set of Technology.

It provides a framework for the growth of the computer technology. There are totally Five Computer Generation still today. Discussed as following.

First Generation:

- **Duration: 1942-1955**
- **Technology: vacuum tube**
  - **Used as a calculating device.**
  - **Performed calculations in milliseconds.**
  - **To bulky in size & complex design.**
  - **Required large room to place it.**

- **Generates too much heat & burnt.**
- **Required continuously hardware maintenance.**
- **Generates much heat so must air-conditioner rooms are required.**
- **Commercial production is difficult & costly.**
- **Difficult to configure.**
- **Limited commercial use**

Second Generation:

- **Duration: 1955-1964**
- **Technology: transistor**
  - **10 times Smaller in size than 1st generation system.**
  - **Less heat than 1st generation computers.**
  - **Consumed less power than 1st generation system.**
  - **Computers were done calculations in microseconds.**
  - **Air-conditioner is also required.**
  - **Easy to configure than 1st generation computers.**
  - **More reliable in information**
  - **Large & fast primary/secondary storage than 1st generation computers**

Third Generation:

- **Duration: 1965-1975**
- **Technology: IC chip**
  - **Smaller in size than 1st & 2nd generation computers.**
  - **Perform more fast calculations than 2nd generation systems.**
  - **Large & fast primary/secondary storage than 2nd generation computers.**
  - **Air –conditioner is required.**
  - **Widely used for commercial applications.**

- **General Purpose computers.**
- **High level languages like COBOL & FORTAN are allowed to write programs.**
- **Generate less heat & consumed less power than 2nd generation computer.**

Fourth Generation:

- **Duration: 1975-1989**
- **Technology: Microprocessor chip**
  - **Based on LSI & VLSI microprocessor chip.**
  - **Smaller in size.**
  - **Much faster than previous generations.**
  - **Minimum hardware maintenance is required.**
  - **Very reliable as computer to previous generation computers.**
  - **Totally general purpose computer.**
  - **Easy to configure.**
  - **Possible to use network concept to connect the computer together.**
  - **NO requirement of air-conditioners.**
  - **Cheapest in price.**

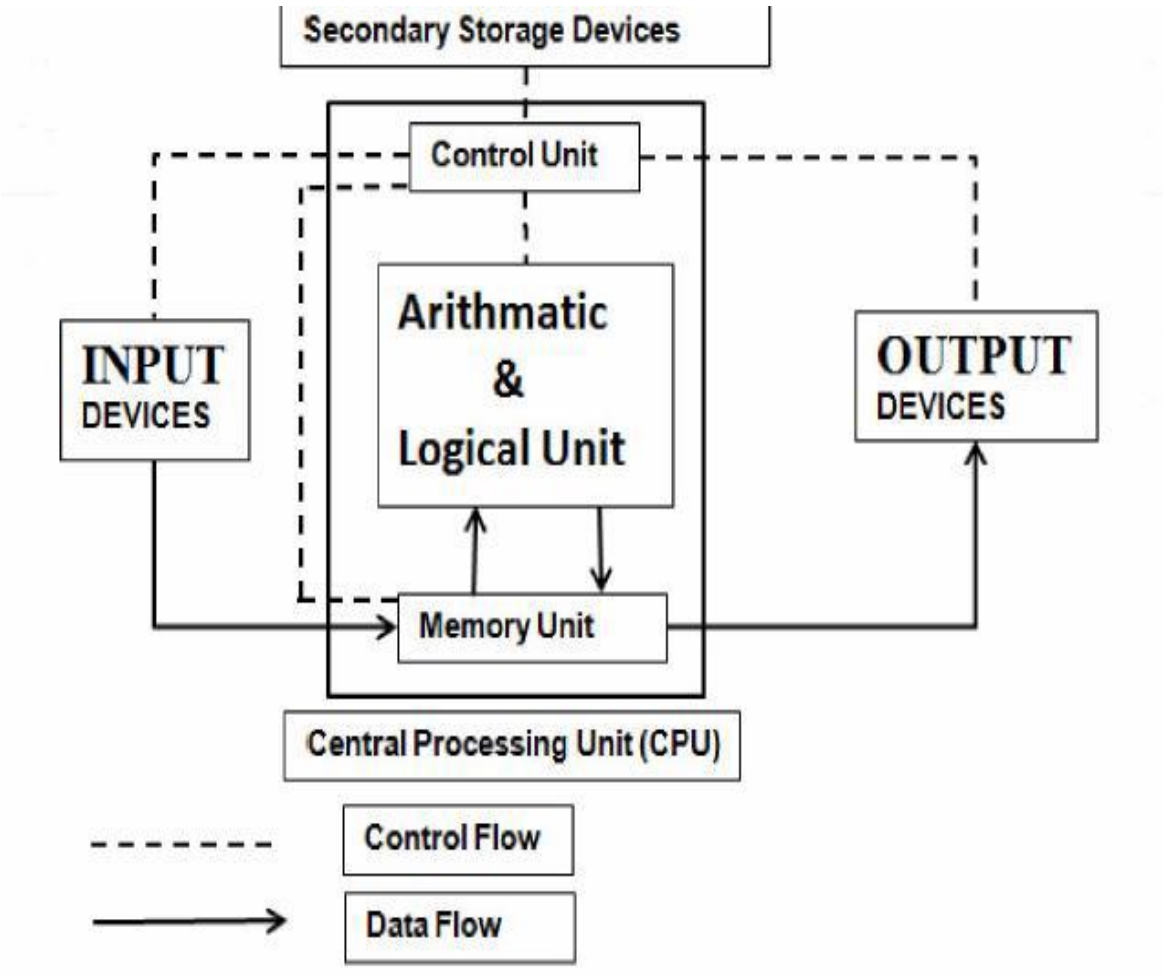
Fifth Generation:

- **Duration: 1989 to Present**
- **Technology: ULSI microprocessor chip**
  - **Much smaller & handy.**
  - **Based on the ULSI chip which contains 100 million electronic components.**
  - **The speed of the operations is increased.**
  - **Consumed less power.**

- **Air-conditioner is not required.**
- **More user friendly interface with multi-media features.**
- **High level languages are allowed to write programs.**
- **Larger & faster primary/secondary storage than previous generations.**

7. EXPLAIN THE BLOCK DIAGRAM OF COMPUTER OR EXPLAIN THE SIMPLE MODEL COMPUTER.

A simple computer system comprises the basic components like Input Devices, CPU (Central Processing Unit) and Output Devices as under:



• Input Devices:

- **The devices which are used to entered data in the computer systems are known as input devices.**
- **Keyboard, mouse, scanner, mike, light pen etc are example of input devices.**

FUNCTION OF INPUT DEVICES

- **Accept the data from the outside worlds.**
- **Convert that data into computer coded information.**
- **Supply this data to CPU for further processing.**

• Output Devices:

- **The devices which display the result generated by the computer are. known as output devices**
- **Monitor, printer, plotter, speaker etc are the example of output devices.**

FUNCTIONS OF OUTPUT DEVICES

- **Accept the result form the CPU.**
- **Convert that result into human readable form.**
- **Display the result on the output device.**

• Memory Unit:

- **The data & instruction have to store inside the computer before the actual processing start.**
- **Same way the result of the computer must be stored before passed to the output devices. This tasks performed by memory unit.**

FUNCTIONS OF MEMORY UNIT

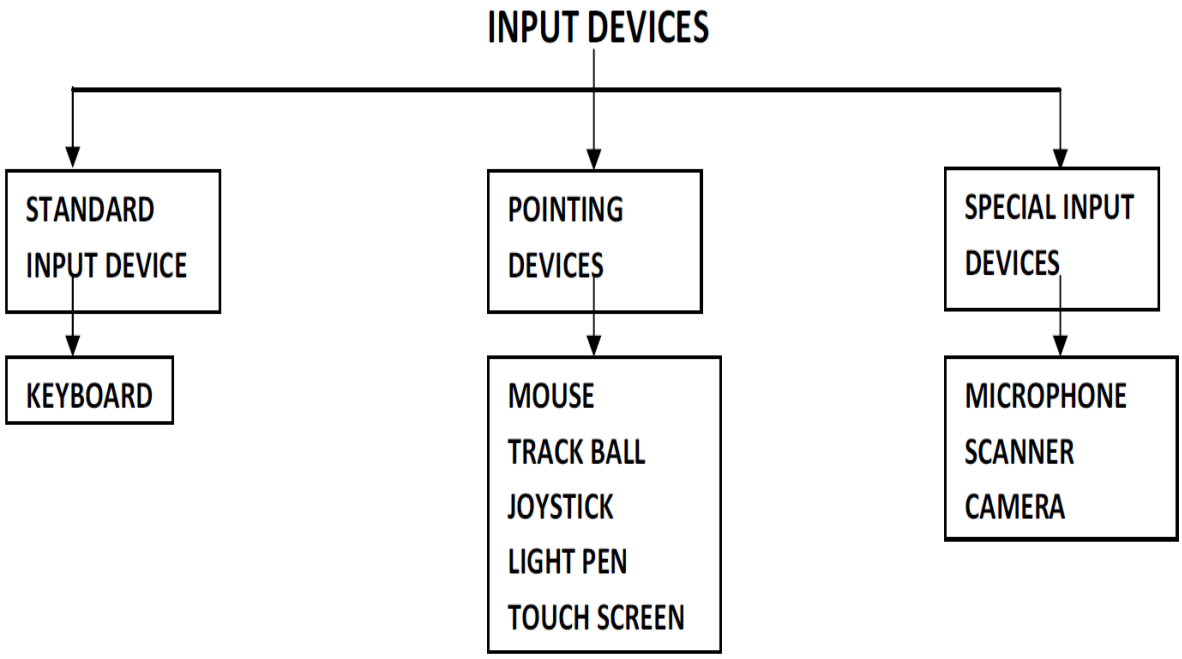
- **Store data & instruction received from input devices.**
- **Store the intermediate results generated by CPU.**
- **Store the final result generated by CPU.**

- **Arithmetical & Logical Unit:**
  - **the ALU is the place where actual data & instruction are processed.**
  - **All the calculations are performed & all comparisons are made in ALU.**
  - **Performs all arithmetical & logical operations.**
  - **An arithmetic operation contains basic operations like addition, subtraction, multiplication, division.**
  - **Logical operations contains comparison such as less than, greater than, less than equal to, greater than equal to, equal to, not equal to.**

- **Control Unit:**
  - **It controls the movement of data and program instructions into and out of the CPU, and to control the operations of the ALU.**
  - **In sort, its main function is to manage all the activities within the computer system.**
  - **Controls the internal parts as well as the external parts related with the Computer.**
- **CPU:**
  - **the Unit where all the processing is done is called as Central Processing Unit.**
  - **It contains many other units under it.**
  - **Main of them are:- Control Unit And ALU (Arithmetic & Logic Unit)**

UNIT: 2 INPUT DEVICES

CLASIFICATION OF INPUT DEVICES:



2. EXPLAIN STANDARD INPUT DEVICE: KEYBOARD.

- **Keyboard is most commonly used input device.**
- **It is similar like a type writer which is used to enter data in the computer.**
- **It contains sets of keys such as alphabets, number & special signs.**
- **There are two types of keyboard.**
  - **General Purpose keyboard**
  - **Special purpose keyboard**

GENERAL PURPOSE KEYBOARD:

- **Standard keyboard which are used in personal computers.**
- **It contains enough keys which are used in all types of applications so they are known as general purpose keyboard.**
- **Most popular general purpose keyboard contains 101 keys.**
- **The general purpose keyboard are divided into following parts:**

ALPHANUMERAIC KEYPAD

- **The centred part of the keyboard is known as alphanumeric keypad.**
- **It contains alphabets, numbers & special signs such as *,!, @, #, $, %,* etc.**

NUMERAIC KEYPAD

- **The right most part of the keyboard is known as numeric keypad.**
- **It contains 0 to 9 numbers & mathematical signs such as +, *, -, /.**
- **Mainly used for fast data entry in mathematical applications.**

ARROW KEYS

- **Set of four keys up, down, left & right.**
- **Used to move the cursor at left & right or up and down on the screen.**
- **They are referred as "cursor-control" or "cursor-movement" keys.**

FUNCTION KEYS

- **The first line of the keyboard contains a Set of 12 keys with name f1 to f2 are known as function keys.**
- **Used to generate short-cuts in different software package.**

SPECIAL KEYS

- **There are lots of keys that are used for some specific task describes follows:**
- **TAB: used for gives multiple spaces or move the cursor to next defined position.**
- **ENTER: used for generate the output of any command.**
- **SPACE: used to make one blank space between two words.**
- **BACKSPACE: used to remove the left-most character at cursor position.**
- **DELETE: used to remove the right-most character at cursor position.**
- **HOME: moves the cursor at the beginning of the line.**
- **END: moves cursor at the end of the line.**
- **PAGE UP: moves or scroll the screen up or previous page of the current page.**
- **PAGE DOWN: moves the screen to the next page from the currently displayed page.**
- **PRINT SCREEN: used to print what is currently displayed on the screen.**
- **INSERT: used to enter text between two characters.**
- **ESC: used to negate current command or terminate the execution of the program.**
- **ALT: used to expand the functionality of keyboard. Basically used to generate shortcuts in different application.**
- **CTRL: used to expand the functionality of keyboard. Basically used to generate shortcuts in different application.**
- **NUMLOCK: used to on or off the numeric keypad.**
- **CAPSLOCK: used to type the all inputted text capitally.**

SPECIAL PURPOSE KEYBOARD

- **Special purpose keyboard is used for special purpose applications which required faster data entry and rapid interaction with the computer system.**
- **For example ATM used in banks used special purpose keyboard which contains a few keys.**

3. EXPLAIN POINTING DEVICES.

1. MOUSE

- **Mouse is Small hand-hold device Input device which is generally used for drawing purpose.**
- **It's a Pointing device.**
- **It contains two or three buttons**
- **Left button is used to point out or select any item by clicking.**
- **Right to generate context menu.**
- **When user moves mouse across flat surface, the graphic cursor moves on screen.**
- **Graphic cursor contains Varity of symbols such as arrow, wrist, pointing finger etc.**

2. WEB CAMERA

- **It's an input device.**
- **Used to feeds the image to a computer or computer network often via USB or Wi-Fi.**
- **Web camera is a hardware camera connected to a computer that allows everyone to connect to internet to view either pictures or motion video.**
- **Most Web cameras are embedded to display with laptop computer or connected with USB or Wi-Fi with a computer.**

- **Simple web cam. Consists a digital camera attached to your computer typically through USB**
- **These images are stored image into the physical memory of camera in built in.**
- **After capture image & stored in memory it reduced the amount of data need to transmit.**
- **Web camera software takes image & converts data in jpeg (compressing format).**

4. EXPLAIN SCANNER & ITS TYPES.

- **Scanners are input devices.**
- **They are capable of entering information directly into the computer.**
- **The main advantage of direct entry of information is that users do not have to key the information.**
- **And another advantage is that through Scanners you can input Graphical Data into the computer.**
- **Provides faster and more accurate data entry. Important types of scanners**

OUTPUT DEVICES

1.WHAT IS OUTPUT DEVICE.

- **The output devices are the devices which are used to display the result generated by the computer system.**
- **Monitor, printer, plotter, speaker are the example of output devices.**

FUNCTIONS OF INPUT DEVICES:

- Accept the result from the CPU.
- Convert that result into human readable form.
- Supply this result to output device.

EXPLAIN CRT (CATHOD RAY TUBE) MONITER.

- The monitor is the common output device mostly used It is a softcopy output device.
- It can be thought of as a high resolution TV set.
- The monitor can also determine if the display will be colour, black and white, or include graphical objects (pictures).
- Two types of monitors are used.
  - CRT monitors.
  - Non CRT monitors. LCD (Liquid Crystal Display) PDP (Plasma Displays Panel)
- Most computer monitors are based on Cathode Ray Tube (CRT) technology.
- The basic operation of these tubes is similar to that in television sets.

WHAT IS PRINTER? EXPLAIN THE TYPES OF PRINTER.

Printer

- The printer is a most commonly used output device.
- It is used to producing the hard copy output.
- It prints characters, symbols & graphics on the paper.
- Printer can be categorised according to the technology used in printer, speed, and approach of printing, colours, language & the quality of printing.

- **Mainly printer can be classified in two types:**
  - **Impact printer**
  - **Non impact printer**

IMPACT PRINTER:

- **It works on the same mechanism of type-writer.**
- **It forms a character or image by striking mechanism such as hammer or wheel against to ink ribbon, leaving an image on paper.**
- **It is oldest technology and still is in used.**
- **It can capable to print single character or line at the same time.**

CHARACTERISTICS OF IMPACT PRINTER:

- **Physical contact with paper to produce output.**
- **Low cost**
- **Very noisy**
- **Very slow in printing**
- **Low-quality print out**

NON IMPACT PRINTER:

- **Non impact printer forms characters & images on paper without actually striking the paper.**
- **Paper & print head come in contact & hence the text or image is formed.**
- **Ink jet & laser printer are example of nonimpact printer.**

CHARACTERISTICS OF NON IMPACT PRINTER

- Faster than impact printer.
- Ability to change type face automatically.
- High quality output.
- More expensive than impact printer.
- Less maintenance than impact printer.

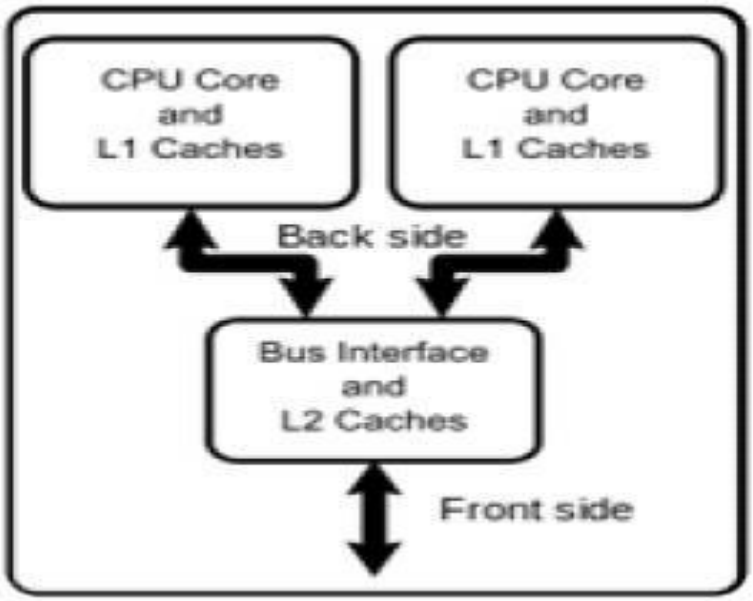
WRITE DOWN THE DIFFERENCE BETWEEN IMPACT & NON-IMPACT PRINTER.

Impact printer	Non impact printer
Printing character by striking hammer against ink ribbon to produce output	Printing characters or graphics by spraying ink on paper.
Slow in speed	Faster than impact printer
Work with any environment	Can't work with all environment
Less expensive than non impact printer	More expensive than impact printer

Noisy during printing	Silent during printing
Able to produced carbon copy output	Cant able to produced carbon copy output
e.g.: daisy wheel, drum, chain, dot matrix	e.g.: inkjet, laser

1. EXPLAIN TYPES OF PROCESSORS.

DUAL CORE



- **Dual-core refers to a CPU that includes two complete execution cores per physical processor.**

• It has combined two processors and their caches and cache controllers onto a single integrated circuit (silicon chip)

• Multi-core is similar to dual-core in that it is an expansion to the dual-core technology which allows for more than two separate processors.

- **Since each core has its own cache, the operating system has sufficient resources to handle most compute intensive tasks in parallel.**

ADVANTAGES:

• Performance is faster than single-core processors.

• Able to divide information for processing by multiple units.

• Core processor uses slightly less power than two coupled single-core processors

- **Multi-core chips also allow higher performance at lower energy.**

CORE 2 DUO

- **Core 2 Duo is the name given by Intel to its second batch of dual core processors.**
- **Desktop PCs with the Intel® Core™2 processor family deliver faster performance, greater energy efficiency, and more responsive multitasking.**
- **The difference between dual core processors and the Core 2 Duo processors is just in the semantics as Core 2 Duo is simply a name given to a more recent family of dual core processors.**

Features and benefits

- **With an Intel® Core™2 Duo processor you will get performance-rich technologies,**
- **Intel® multi-core processing provides greater multitasking performance by combining two independent processor cores in one physical package.**
- **Execution improves execution time and energy efficiency with more instructions per clock cycle.**
- **Power Capability enables smarter, more energy-efficient performance.**
- **Intel® Smart Memory Access improves system performance by optimizing the use of the available data bandwidth**
- **Intel® Advanced Smart Cache enables higher performance and more efficient cache subsystem by optimizing for multi-core processors.**

EXPLAIN PRIMORY STORAGE DEVICE

- **It's a temporary storage.**
- **It consists of some chips.**
- **The data & instruction are resided in this memory when the CPU executing programs.**
- **This memory can capable to store & retrieved data very quickly.**
- **Primary memory is only the memory that is directly access to the CPU.**

RAM

- **The complete name of RAM is random access memory which is also known as Primary memory.**
- **It is called read/write memory because data can be read as well as write in RAM.**
- **It is called random access because you can directly access any data from RAM if you know row & column cell.**
- **The RAM chip is fixed on the mother board & the mother board is designed in such a way that its memory capacity can be enhanced by adding more RAM chip.**
- **RAM is a VOLETILE memory.**

EXPLAIN PRIMORY STORAGE DEVICE.

- **It's a temporary storage.**
- **It consists of some chips.**
- **The data & instruction are resided in this memory when the CPU executing programs.**
- **This memory can capable to store & retrieved data very quickly.**
- **Primary memory is only the memory that is directly access to the CPU.**

RAM

- **The complete name of RAM is random access memory which is also known as Primary memory.**
- **It is called read/write memory because data can be read as well as write in RAM.**
- **It is called random access because you can directly access any data from RAM if you know row & column cell.**
- **The RAM chip is fixed on the mother board & the mother board is designed in such a way that its memory capacity can be enhanced by adding more RAM chip.**
- **RAM is a VOLETILE memory**

SRAM:

- **Static Random Access Memory is also a volatile memory.**
- **Once data is written into the chip, it is maintained as long as power is supplied to it; it does not need refreshing.**
- **However, SRAM is slower than DRAM and it is also more expensive.**

ROM

- **The complete name of ROM is read only memory.**
- **The data stored permanently & can't be altered by the programmer.**
- **Data stored in RAM chip can be read & used but cannot be changed.**
- **It is basically used to store manufacturer programmed & user program.**
-

EPROM & EEPROM

- **Erasable Programmable Read Only Memory and Electrically Erasable Programmable Read Only Memory chips can be electrically programmed.**
- **Unlike ROM and PROM chips, EPROM chips can be erased and reprogrammed.**

DATA STORAGE

WRITE A DETAIL NOTE ON HARD DISK

- **Hard disks are most popular secondary storage device.**
- **It supports the direct access of the data.**
- **It's a thin magnetic plate which is made of metal n both side coated with magnetic material.**
- **The disk is divided in many tracks & the data is store in both side of the disk.**

- **The disk drive pack has a separate read/write head for each disk surface.**
- **The disk drive consists of motor to rotate the disk pack about its axis at a speed of about 5400 revolution per minute.**

SHORT NOTE : CD-ROM

- **CD-ROM (Compact Disk – Read Only Memory) is a non-erasable backing store which can hold large amounts of data.**
- **It's a shiny silver color metal disk of 5 ¼ inch and the storage capacity about 650 megabytes.**
- **Many of today's micro-computers come with CD-ROM readers and as a result, CD-ROM is popularly used for distribution of software, digitized graphic images as well as Multi-Media material.**
- **Information is written on the disk surface by shining a laser beam.**
- **As a disk rotates the laser beam traces out a continuous spiral.**

Advantages:

- **Cost per bit is Low.**
- **Need not have any mechanical read/write heads to read/write data.**
- **Compact in size.**
- **Light weight**

Disadvantages:

- **Read only storage medium.**
- **Slower access speed than magnetic disk.**

EXPLAIN IN BRIEF: DVD

- **DVD (Digital Versatile Disk) is optical disk storage.**
- **Basically it is used for storing large amount of data including movies with high video & sound quality.**
- **Work on the same principle of CDROM.**

- **Data is recorded on each layer so that the storage capacity is become large.**
- **Total capacity of DVD is 8.5 GB.**

Advantages

- **Larger capacity than CD.**

Disadvantages:

- **Expensive than CD.**
- **Damaged if not handled properly.**

EXPLAIN IN BRIEF: ZIP DISK

- **It's a high capacity, removable magnetic disk which can be read or write by ZIP drive.**
- **It is similar to floppy disk except that much faster & larger capacity.**
- **Zip disks are available in two size namely 100 megabytes & 250 megabytes.**

Advantages:

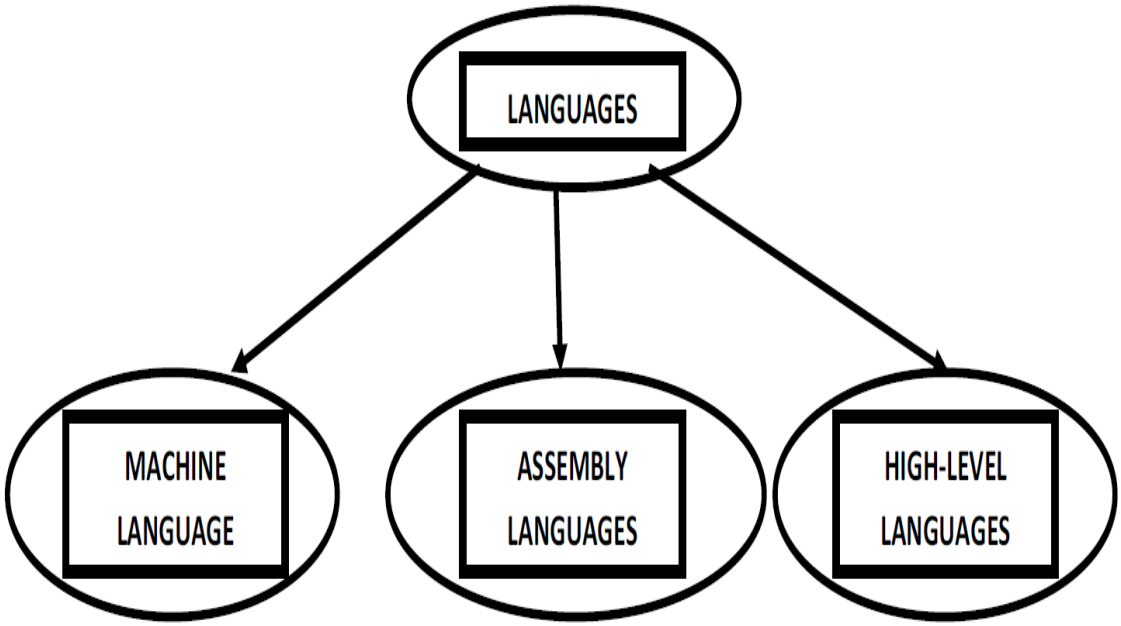
- **Easy to use .**
- **Large capacity than floppy disk.**
- **Faster than floppy disk .**
- **Easy to carry.**

Disadvantages:

- **Expensive .**
- **Data transfer between drive & computer is slow.**

LANGUAGES, OPERATING SYSTEM & SOFTWARE PACKAGES

- **Computer Languages can be classified into three broad categories:**



WHAT IS MACHINE LANGUAGE?

- **Computer programs are written using many different computer Languages but the language which is understood by the computer without translating program is called machine language.**
- **Machine language is normally written as string of binary 1s and 0s.**
- **A machine language instruction has two part format.**

OPCODE (OPERATION CODE)	OPERAND (ADDRESS)

- **The 1st part is the operation code which tells the computer what function to be performed.**
- **The 2nd part is the operand which tells the computer where to find & store data to be manipulated.**
- **So each instruction tells the computer what operation to perform & the length & location of the data field which are involved in the operation.**

Disadvantage

- Difficult to program
- Difficult to modify
- Time consuming to code

- Operation codes have to be memorised
- Assignment of memory is done by programmer

- Programs development are machine dependent
- Preparation of programs was slow and costly

EXPLAIN ASSEMBLY LANGUAGE.

- Assembly language is a language which allows instruction & storage location to be represented by letters & symbols, instead of number.
- A program written in an assembly language is called assembly language program or symbolic program.
- Assembly language was introduced in 1952.

- Assembly language is a language which allows instruction & storage location to be represented by letters & symbols, instead of number.
- A program written in an assembly language is called assembly language program or symbolic program.
- Assembly language was introduced in 1952.

- It allows using alphanumeric mnemonic codes instead of numeric code for the instructions in instruction set. For example using ADD instead of 1110 or 14 to add.

Format of assembly language is similar to machine language:

MNEMONIC CODE	SYMBOLIC ADDRESS

Assembler

- **Assembler is a special program (translator) which translates symbolic operation codes into machine codes, and symbolic address is addressed into an actual machine address.**

Advantage

- **Easier to use, code and understand.**
- **Easier to correct error.**
- **Easier to modify.**
- **Efficiency of machine language.**

Disadvantage

- **Machine depended.**
- **Programs have to be translated before execution.**
- **Translation of programs takes up time.**
- **Knowledge of hardware is required.**
- **Additional storage area needed for the source programs and object code.**

WRITE A NOTE ON HIGH LEVEL LANGUAGE.

- **The machine language & assembly language requires a good knowledge of internal structure of computer.**
- **The both languages are machine dependent & it is difficult to solve error.**
- **To remove this limitation the high level language are introduced.**

- **The high level languages machine independent so it can be easily executed on any computer.**
- **The high level language programs do not require any knowledge of internal structure of computer so the programmer concentrate on the logic of problem rather than internal structure of computer.**
- **It enables the programmer to write instructions using English words & familiar mathematical symbols & expression so the program makes easier to code & understand.**
- **It requires a translator program to convert high level program into machine language**

Compiler

- **Compiler is a special program (translator) which translates high level programs into machine codes.**

Advantages:

- **Machine independent.**
- **Easier to learn, use and understand.**
- **Easier to correct error.**
- **Easier to maintain.**
- **Less time & efforts.**
- **Program preparation cost is low.**
- **Few errors.**

Disadvantages:

- **Less flexible.**
- **Lower efficiency.**
- **Require more time & storage space.**

WHAT IS OPERATING SYSTEM?

- **An operating system is a software program that provides an interface between user & the computer and manages thousands of applications.**
- **It's a collection of system software that co-ordinates between the hardware, provides a platform for software to run on.**
- **An operating system is an integrated set of programs that the resources (the CPU, memory, I/O devices etc.) of computer system & provides an interface to the user to run the machine.**
- **The main two primary objective of operating system are:**

O making a computer system convenient to use.

- **Managing the resources of a computer system.**

FUNCTION OF OPERATING SYSTEM

1) PROCESS MANAGEMENT

- **The process management of OS taking care about the creation & deletion of user & system process, providing mechanism for process synchronization & process communication.**

2) MEMORY MANAGEMENT

- **The memory management of OS taking care about the allocation & de allocation of memory space to the various programs in need of this resource.**

3) FILE MANAGEMENT

- **The file management of OS is taking care about the file related activities such as creation, storing, retrieving, naming, sharing & organization of files.**

4) SECURITY

- **The security model of OS protects the resources & information of a computer system against destruction & unauthorized access.**

5) COMMAND INTERPRETATION

- **This model taking care of interpreting user commands & directing the system resources to handle the requests.**

EXPLAIN REALTIME OPERATIN SYSTEM.

- **Real-Time systems are always on-line but on-line systems need not be real-time systems.**
- **By definition, a real time system receive data and process it quickly enough to produce output which can be used to control or affect the outcome of an ongoing activity of process.**
- **In general, real-time systems handle small volumes of data at any one time and the turnaround time is critical.**
- **Feedback is essential in real-time systems so that processing can keep pace with external factors.**
- **Most real-time systems are used in mission critical application like process control and therefore, reliability and availability is of paramount importance.**

Advantages

- **Error messages are immediate**

- **Source documents are available at the time the error occurs.**
- **Faster than on-line systems.**

Disadvantages

- **Direct access devices have to be used.**
- **Control checks are difficult since updating occurs at the time of processing.**

EXPLAIN TIME SHARING OPERATING SYSTEM

- **Time-sharing is a mechanism that allows the many users to use a computer system in such a way that each user is given the impression that they use their own system.**
- **It has many user terminals simultaneously connected to the same computer.**
- **Using these terminals multiple users can simultaneously work on the system.**
- **The multiprogramming feature allows multiple programs to simultaneously reside in the memory.**
- **The special scheduling algorithm used in a time-sharing system.**
- **In this very short period of CPU time allocates to each user process.**

Advantages:

- **Reduce CPU idle time**
- **Provides advantages of quick response time.**
- **Offers good computing facility to small users.**