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INTRODUCTION OF CALCULATOR AND COMPUTER:-

- Calculator comes from the word calculate which means arithmetical operation.
- Computer comes from the word compute which means both arithmetical operation and logical operation.
- Computer refers to +,-,*, /, =, <,>, <=,>=, etc.
- Calculator refers to, +,-,*, /.
- Computer is an electronic device which performs arithmetical operator and logical operation.
- Calculator is an electronic device which perform only arithmetical operator.
- Computer means a device a tool a machine or a equipment which perform arithmetical and logical operation.
- Electronic device means a device with always work on fixed voltage.

BASIC FUNCTION OF COMPUTER:-

- Does arithmetical operation such as, +,-,*, /.
- Compare values.
- Storage ,search retrieve(result)

CHARATERSTICS OF COMPUTER:-

- **VERY HIGH SPEED.**
- **SUPER HIGH ACCURACY &DEGREE OF RELIABILITY.**
- **STORAGE CAPACITY.**
- **WORK AS SEQUENCE.**
- **POWER OF MACHINILOGY.**
- **VERSATILITY**.
- **DELIGENCE.**
- **NO FELLING.**

APPLICATIONS OF COMPUTER:-

- Banking system.
- Railway system.
- Internet.
- Shopping mole management.
- Hospital management.

- Airline management.
- Electronic media management.
- Biotechnology.
- Agriculture management.
- Treatment of health.
- Share market management.
- Seen video clip and film.
- Post office management.

ANATOMY OF COMPUTER:-

There are three types of anatomy:-

(1) Input unit.
(2) C.P.U.
(3) Output Unit.
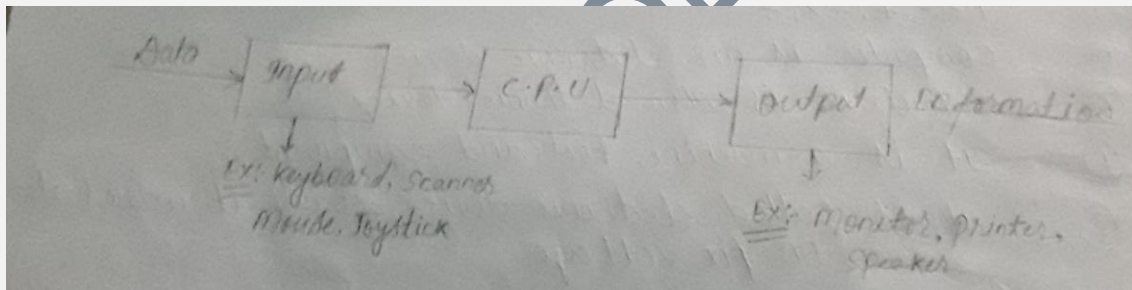
Input unit ex- keyboard, mouse, and scanner.
Output Unit. EX:-Monitor, Printer, Speaker.

- **INPUT: -** It is use for accepting the data; the data are interred into the computer system.
- **C.P.U:-** It is use to process the data .the entered data is process by CPU.
- **OUTPUT UNIT: -** It gives the specific result for information.
- **DATA:-** Data are row fact. The unarranged facts and figure the instruction given to the computer for desire result.

- **INFORMATION: -** It is retrieve the data, process data result given by the computer after processing manipulates data information is summarization of data.
- **IMPORTANT OF INFORMATION:-**
- Meaningful.
- Surprise element.
- Accuracy.
- Time line (to take timely action).
- Conformity with previous knowledge.
- Correction of previous knowledge.
- **INFORMATION ECNOMY: -** Information is an available resource in any organisation.

However the preparation of formal information is not free. It cost money, how much an organisation expends of money.
 The information regarding cost of providing ,major value of information, budget information etc.

  INFORMATION SOCIETY:- The information society can be simply defined the instruction man and machine which under man and control gather data and broadcast information all work is done by a person called information socity.

- **HISTORY OF COMPUTER:–**
- Computer comes from the word compute which means do calculation.
- Computer was invented because man needed fast and accurate calculating device.
- Modern-day computer with speed and power is not the invention of individual mind.
- It is the result of countless of invention, ideas and development contributed by several of number of person a last several decades.
- In the human race start a doing some trade. It felt need from calculating device.
- Some contribution regarding history of computing is as follow:-

      (1) ABACUS.
      (2) NEPIER'S LOGS AND BONES.
      (3) PASCAL'S ADDING MACHING MACHINE.
      (4) JOSEF JACQUARD LOOMS.
      (5) CHARLES BABBAGE.
      (6) HERMAN HOLLERITH MACHINE.

(1)**ABACUS:**–

- Abacus the earlier and simplest device use for calculation was abacus.
- It was the first machine calculating invented in 3000 b c by Chine's.
- Abacus a Day board with certain numbers of beats problem.

(2)**NEPIER'S LOGS AND BONES:-**

- The next manual calculating device logarithm was invented by John Napier in 1617.
- The use of logarithm enable due to transform multiplication and division into addition, subtraction problem.
- Log a*b   = Loga+Logb.
- Log a/b   = loga -logb.
- You also invited bones card with solve multiplication problem.

• **PASCAL'S ADDING MACHINE:-**

- The first machine adding machine was invented by blasé Pascal's in 1642.
- It develops it to help this father who was officer in France.
- The next machine was more effective calculator produce by in 1671.
- It was used to perform multiplication and division.

• **JACQWARDS LOOM:-**

- Joseph's jacquard was a textile menu feature.
- He invented automatic loom in 1804.
- He was punch card to produce complex cloth pattern day automatic loom.
- The function of loom depends upon the effect or present of hook on the class.

- Jacquards looms pass the away for modern stories or machine and binary coding system on punch card.
- **<u>CHARLES BABBAGE</u>-(1792-1871)**
- Charles Babbage is a father of computer (Because bring out the concept of speed and storage).
- Charles Babbage – a professor of mathematics at the Cambridge University.
- In 1882 Charles Babbage invented of automatic differentials engine.
- Differentials engine which could volume of accounting algebraic calculating and mathematical table UPTO 20 decimal place.
- Letter of 1842 this genius was able to develop electronic engine which was automatic machine design to addition.
- To build analytical engine he spent Seventy Thousand Dollar on this project at the time.
- Then analytical engine to able the store intermediate result and setup words for substance calculations.
- His ideas storage derived from the punch card of Joseph jacquard.
- **<u>HOLIERITH MACHINE:-</u>**
- The next major contribution to development can for Herman Hollerith of U.S.A.
- Hollerith development a machine run or electrically first for the calculating and recording of data.
- Hollerith machine was capable of reading both the number data processing giving out the latter.
- The input was in form of punch card and communications holes for according of data be invented a machine called tabulator.
- The established a company t m c (tabling machine company) in 1896 which today know as **IBM** (international business machine).
- **NOTE:-**Howard's Aiken first fully electrical mechanical computer called "MARK-1".

- **INFORMATION SYSTEM:-**
  Information produces with the help of computer system.
  Information via human computer interface.
  EX:- BANK INFORMATION SYSTEM.
     RAILWAY INFORMATION SYSTEM.
  HOSPITAL INFORMATION SYSTEM.

- **INFOFMATION TECHNOLOGY:**-
- It is based on communication of h/w equipment machine that facilities creation modification storage retrieval transition of information via electronic media.
- It is based on both computing and communication.
- Source:-
  (1) Equipment.
  (2) Telly communication (video, TV).
  (3) Science.
  (4) Computer human interface.
- **MULTI MEDIA;–**
- Multi
- Media- communication source of information.
- It is the combination of audio (sound) graphic (drawing and painting), animation (movie and image) video text etc.
- It is the latest revaluation of sweao the world of information techonology.
- It is already being in verity of application.
- Media publishing graphics.
- Media after new carrier option for young professional.

- **UNIT-2**
- **CLASSIFICATION OF COMPUTER;-**
- Traditionally computer was classified on the basis of cost, speed, memory, size and power supply.
- Today's computer is classified on the basis of feature.
- Some classification of computer is as follow.

- 1. Generation of computer.
- 2. Digital vs. Ana log computer.
- 3. Single user vs. multi-user.
- 4. General use vs. special purpose.
- 5. micro/mini/mainframe/supercomputer.

GENERATION OF COMPUTER:-

It is classification of computer on the basis of generation.
Generation means to development of our computer electrically data process.

Computer technology is aimed that chipper, smaller, efficient computer.

Generation is divided into five parts:-

1. First generation of computer. (1942-1955).
2. Second generation of computer. (1955-1964).
3. Third generation of computer. (1964-75).
4. Fourth generation computer. (1975-1989).
5. fifth generation computer(1989-present)

- **FIRST GENERATION COMPUTER**(1942-1955):-
- The first generation is based on vacuums tube technology.
- Thousand of vacuums tube use to build a computer vacuums tube were big in size (a size of one vacuums tube is equivalent to small electric bulb which used filament as a source of electronic control and signal.
- **FEATURE OF FIRST GENERATION COMPUTER:–**
- They are too large in size requiring large room for installation.
- They emitted a large amount of heat a c room with be required to keep this computer.
- The power consumption of this computer was very high.
- They had limited life because vacuums tube burnet frequently.
- This computer are difficult to programme and used.
- They had a limited commercial use.

---------Ex-----------

1. **ENIAC-** electronic numerical integrator and calculator.
2. **EDVAC-** electronic discreet variable automatic computer.
3. **EDSAC-**electronic delay storage automatic computer.

- **SECOND GENERATION (1955-1964):**-
- The major contribution given by three scientific John Borden, Williomshockly, watterbrattain in 1947 and bell labrotries.
- They invented transistor for with they receive noble prize.
- A transistor mode up of a semiconductor material whose major part silicon.
- Vacuum tube was replaced by transistor in 1959.
- **FEATURE OF SECOND GANERATTION COMPUTER:-**
- They were much smaller requiring small place.
- They emitted much less heat as compare vacuum tube.
- They consume much less power than 1st generation computer.
- They ware more reliable.
- They have wider commercial use.

   : Ex--------:-
   UNIVAC:-Universal Automatic computer.
   Ibm7030
   Cdc1704

- **THIRD GENERATION (1964-1975):-**
- In third generation computer technology was completely changed (transistor were replaced by I c) around 1965.
- Integrated circuit combinations of transistor and other electronic components flushed together a signal crystal.
- Essentially I c contain only about 10to20 electronic components.
- This technology name s s i.

- Letter with this advantage I c it became possible to integrated about 100 electronic component one a single crystal this technology has name m s i.
- **FEATURE OF THIRD GENERATION COMPUTER;**-
- They were much powerful than second generation.
- They were much smaller than second generation.
- They consume much less power in compression of second generation.
- They were totally general purpose machine.
- They commercial in wider and chipper much high level language such as COBOL, basic.fortan Pascal etc.
- A new industry was born during.
- **FOURTH GENERATION COMPUTER(1975-1989):-**
- In fourth generation that is I c were replaced by microprocessor.
- Micro processor contain and entire central processing and a single chip.
- L S I and V L S I technology were used in fourth generation in which one million electronic component were pushed single chip.
- **FEATURE OF FOURTH GENERATION:-**
- The social revolution the pc was started to individual.
- The pc smaller and cheaper in compression of mainframe of 3rd generation computer.
- They are faster and large primary and secondary memory.
- High level language was fully developed.
- The consume much less power in compression of 3rd generation computer.
- They are totally general purpose machine and affordable by individuals.

    Ex – micro computer.
- **FIFTH GENERATION COMPUTER-(1989-AT PRESENT):-**

- There is certain advantagement in the science of computer design and technology.
- Design and technology are combining together; enable the creation of 5th generation computer.
- Two such as advantage are.
    1. Parallel processing replacing.
    2. Van new single chip.
    3. **ULSI**- ultra large scale integrations replaced V L S I in which 10 million of electronic component are pushed in single chip.
- **FEATURE OF FIFTH GENERATION:-**
- Portable (carry easily) pc is invented that enable the mobile computing.
- Pc became were powerful than 4th generation.
- Multimedia feature makes the system easier to learn and use by anyone.
- During fifth generation internet became a popular away from information interchange.
- **GENERAL PURPOSE VS SPECIAL PURPOSE:-**
  GENERAL PURPOSE:-
- It is the classification of use of work.
- There that computer which are used in general work .
- The software is easily available to the user for most of daily life m s office package.
- Example of g p c is pc.
- It is easily available in low cost.
- Maintenance is less.

SPECIAL PURPOSE:-
- There are those computers which are some special work.
- The s/w is not easily available and this type of computer require special type of device also which is used in whether for casting space research aeroplane.
- Example of s p c is mainframe computer.
- It is high cost.
- Maintenance is more.

- **<u>SINGLE USER VS MULTI USER:-</u>**
- <u>SINGLE USER-</u> it is the classification of computer on the basis of user
- The system on which on only one user work on it a time is called single user system number user is working on that computer system it is divided into two types.
- <u>SINGLE USER SINGLE TASTING-</u> the system on which only user can perform only one work at a time is called single user single tasking.
- <u>SINGLE USER MULTI TASKING-</u> the system on which single user can perform multi work at a time is called multi user multi tasking.
-       Ex –win98, win95, win7,winvista, winxp.
- **DIGITAL VS ANALOG COMPUTER:-**
- **DIGITAL COMPUTER:-**
- Digital comes from the word "digit" which means binary digit either 0or 1.Entire expression is in the form of 0(off) 1(on) and all the operation are in the form of 0 and 1.
- Digital computer basically known only how to add remaining operation. Such as Subs traction, Multiplication, Division, Algorithm etc. First convert into addition and then calculated.
- In digital computer data fallowing discontinuous stream.
- It is based on counting rather than measuring.
- In digital computer data defined in individual step.
- It has much speed than other computer.
- Maintains cost is too less.
- It is less affected by unwanted interface noise.
- Representation of digital signal.
- **ANALOG COMPUTER:-**
- Ana log is a Greek word which means similarities between two quantities.

- Ana log similarities are established in the form of currant or voltage signal.
- Data flow continuously which is Ana log to the variable of physical stream.
- Ana log computer operate by measuring rather than counting.
- Ana log computer data defined in continuously in Ana log computer maintains cost is more compression of digital computer.
- It is more noise able compression of digital computer.
- Ana log computer speed is very low compression of digital computer.
- Reparation of Ana log signal.

Figure:-

Analog Reparsentation.
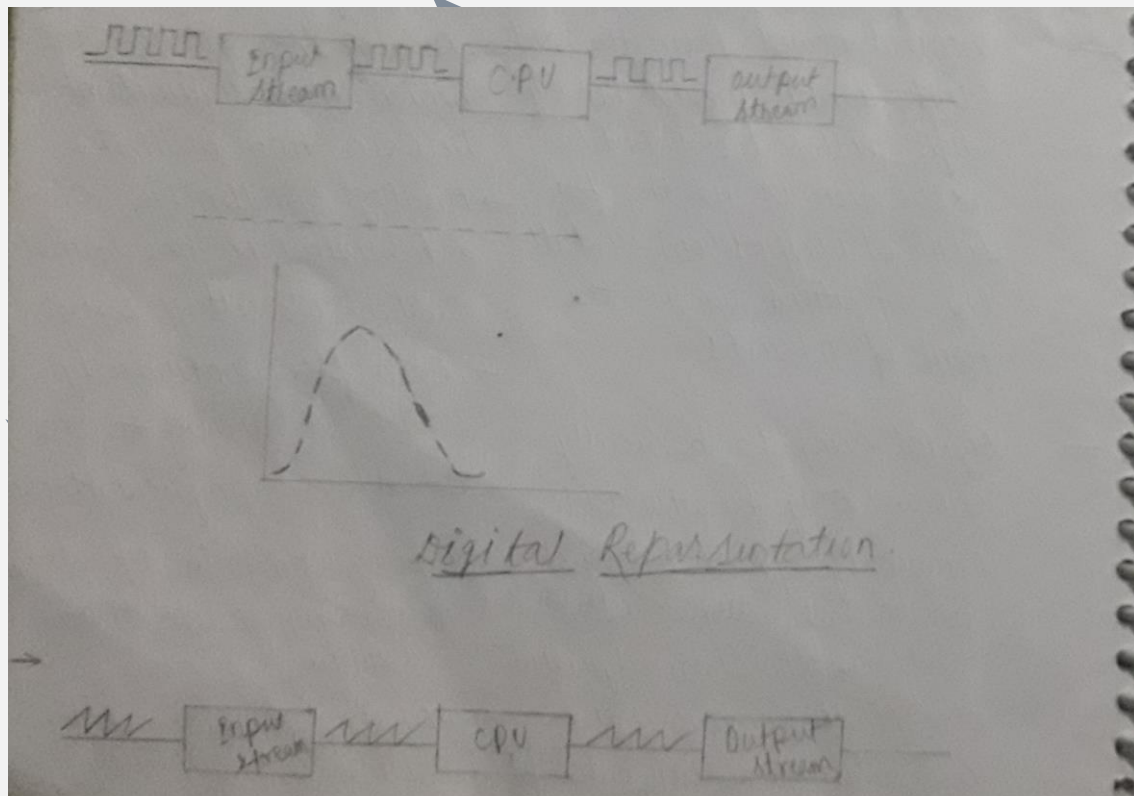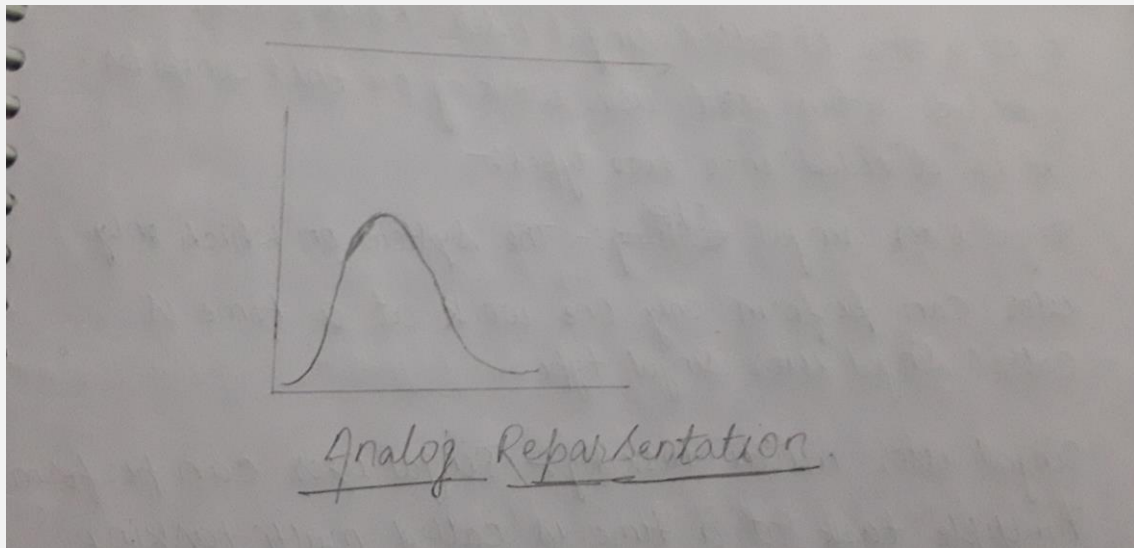
MULTI USER SYSTEM:-

- the system is in which more than one user can work at time is called multi user system. In multi user system many user can work an single system without is any interference to each other.

    Ex – UNIX, Linux, win 2000server.

- ### MICRO-MINI-MAIN-SUPER COMPUTER:-
- It is the classification of computer on the basis of initial memory size.

- ### MICRO:-
- It is the classification of memory size up to 16kb to 4mb.
- Micro computer is called for reason.
- One because it is mini (small) nature in size and another because it uses.
- Uses microprocessor (c.p.u) micro means million parts of unit quantities.
- Initial memory range is 16kb to 4mb.
- No of user is equal to one.
- Example of micro computer is pc.

- ### MINI COMPUTER:-
- It is faster than micro computer.
- It is also small computer so it is set to be minicomputer.

- Initial memory range is to 256kb to 12mb.
- Dec is main manufacture of this computer.
- No of user 4to8.
- **MAIN FRAME COMPUTER:-**
- They large size computer which a large air condition space.
- Its peripheral device are mountain large type of frame so it is called mainframe computer.
- Main manufactures are UNIVAC 1100/60 a class 1100.
- **SUPER COMPUTER:-**
- These computer is five million time faster than 1st ENIAC. memory size up to 256 mb one super computer is equal to 64 mainframe computer.
- No of use in 64*128.
- The first sc is iliac (that perform64 calculator) at a time.
- # END

- **UNIT – 3**
- **DATA REPRESENTATION.**
- **NUMBER SYSTEM:-**
- 1. positional number.(decimal,binary,octal,hexadecimal)
- 2. non positional number,
- **NUMBER:-** number is the symbol used for making majoring and counting. Number system is basically of two types.
- **POSITIONAL NUMBER:-**
- The number which has not any position and base is called non positional number.
- Ex - 0ne for 1
-     Two for 2
- Three for 3
- **POSITINAL NUMBER:-**
- The number which has positional or base in called positional number.
-     Ex =2585

$$2*10^3+5*10^2+8*10^1+5*10^0$$
$$= 2*1000+5*1000+8*10+5*1$$
$$= 2000+500+80+5$$
$$= 2585$$

- Positional number system is divided is four type.
- (1) Decimal number system.(10)
- (2) Binary number system.(2)
- (3) Octal number system.(8)
- (4) Hexa decimal system(16)
- **DECIMAL NUMBER SYSTEM:-**
- The number system which is used in our day to day life is called decimal number system.
- The number which has base 10 is known as decimal number.
- Such as 0,1,2,3,4,5,6,7,8,9.
   Ex -234,536.
- **BINARY NUMBER SYSTEM:-**
- This is exactly decimal number system accept that base is 2 instead of ten (10).
- It has only two symbols or digit 0, 1.
- Ex - 1. $(1101) = (13)_{10}$
 $= 1*2^3+1*2^2+0*2^1+1*2^0$
 $= 8+4+0+1$
 $= 13$
2. $(1111)_2 = (15)_{10}$
$= 1*2^3+1*2^2+1*2^1+1*2^0$
$= 8+4+2+1$
$= 15$
- **BIT;-** Binary digit is obtain refer to by the common abbreviation. In computer hence bits technology means either 0 or 1.
- A binary number system of n bits is called an n bit number.
- List of 4bit binary.

BINARY	DECIMAL OF NO.
0000	0

0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	10
1011	11
1100	12
1101	13
1110	14
1111	15

NOTE-decimal number in the fixed number in the range of 0 to 2n_1 can be represented form is n bit number.

- **BYTE:-**
- Byte is the fix number of abs sent bit that represent a particular system normally a byte consist of eight bit
- 1BYTE= 8bit
- 1kilobyte=2^{10} byte (1024bit)
- Megabyte = 2^{20} byte (1024*1024)
- Gigabyte = 2^{30} byte (1024*1024*1024)
- **OCTOL NUMBER;-**
- In the octal number system base is eight (8).hence these are only eight symbol or digit -0,1,2,3,4,5,6,7.
- Ex –$(2057)^8 = (14)^8$
- **HEXA DECIMAL NUMBER:-**
- In the hexa decimal number is base is 16. there are 16 symbol digit (0_F) .0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15.
                               A,B,C,D,E,F.
- Ex – 32d, c23, a23, etc.
- **Ques- conversion of decimal to binary number$(42)_{10}$ =(101010)**
- Ans –   a̲   r̲
-       42/2 =   21   0

$$21/2 = \quad 10 \quad 1$$
$$10/2 = \quad 5 \quad 0$$
$$2/2 \ = \quad 1 \quad 0$$
$$1/2 = \quad 0 \quad 1$$

- **Quest –convert to decimal no to binary number 73 to binary**.
- Ans- $\underline{a}$ r
-        $73/2=$ 36   1

$$36/2= \quad 18 \quad 0$$
$$18/2= \quad 9 \quad 0$$
$$9/2= \quad 4 \quad 1$$
$$4/2= \quad 2 \quad 0$$
$$2/2= \quad 1 \quad 0$$

Ans; $(73)_{10}= (1001001)_2$

- **Que convertion of Decimal fraction to binary fraction.**
- **Ans –**
- $(81.635)_{10} =(1010001.1010001)_2$

$$\quad\quad \underline{A} \quad r$$
$$81/2 = \quad 40 \quad 1$$
$$40/2 = \quad 20 \quad 0$$
$$20/2 = \quad 10 \quad 0$$
$$10/2 = \quad 05 \quad 0$$
$$05/2 = \quad 02 \quad 1$$
$$02/2 = \quad 01 \quad 0$$
$$01/2 = \quad 00 \quad 1$$

$(81)_{10} = {}_({1010001})_2$

$$0.635*2 = \quad 1.270 \quad 1$$
$$0.270*2 = \quad 0.54 \quad 0$$
$$0.54*2 \ = \quad 1.08 \quad 1$$
$$0.08*2 = \quad 0.16 \quad 1$$
$$0.16*2 = \quad 0.32 \quad 0$$
$$0.32*2 = \quad 0.64 \quad 0$$

- 2. $(0.81250_{10} = \quad (0. 1101)_2$

0.8125*2 =	1.6250	1
1.6250*2 =	1.250	1
1.250*2 =	0.50	0
0.5*2 =	1.00	1

NOTE- the process will be continuing for the seven (7) steps.

- **Que. Conversion of decimal to octal number**.
- $(63)_{10} = (77)_8$

63/8 =	7	7
7/8 =	0	7

- $(256)_{10} = (400)_8$

256/8 =	32	0
32/8 =	4	0
4/8 =	0	4

- $(1024)_{10} = (2000)_8$

1024/8 =	128	0
128/8 =	16	0
16/8 =	2	0
2/8 =	0	2

- **Que. Convertion of decimal fraction to octal fraction**

- $(0.96)_{10} = (75341)_8$

0.96*8 =	7.68	7
0.68*8 =	5.44	5
0.44*8 =	3.52	3
0.52*8 =	4.12	4
0.12*8 =	0.96	1

- $(110.01)_{10} = (156.0057)_8$

$$110/8 = \quad 13 \quad 6$$
$$13/8 = \quad 1 \quad 5$$
$$1/8 = \quad 0 \quad 1$$

$(110)_{10} = (156)_8$

$$0.01*8 = \quad 0.08 \quad 0$$
$$0.08*8 = \quad 0.64 \quad 0$$
$$0.64*8 = \quad 5.12 \quad 5$$
$$0.12*8 = \quad 0.96 \quad 0$$
$$0.96*8 = \quad 7.68 \quad 7$$

$(0.1)_{10} = (0.0050)_8$
$(110.01) = (156.0057)_8$

Note: - the process will continue to 5 step.

Que:-Conversion of decimal number to hexadecimal number

$(426)_{10} = (1AA)_{16}$

$$426/16 = \quad 26 \quad 10$$
$$26/16 = \quad 1 \quad 10$$
$$1/16 = \quad 0 \quad 1$$

$(1076)_{10} = (2409)_{16}$

$$1076/16 = 672$$
$$672/16 = \quad 42$$
$$42/16 = \quad 2$$
$$2/16 = \quad 0$$

Que:-Conversation of decimal fraction to hexadecimal fraction

1. $(0.25)_{10} = (0.04)_{16}$

$0.25*16 = 4.00 = 4$

2. $(0.625)_{10} = (0.10000A)_{16}$
   $0.625*16 = 10.000$

Que:-convertion of octal number to decimal number

1. $(567)_8 = (382)_{10}$

$5*8^2 + 7*8^1 + 6*8^0$
$5*64 + 56 + 6$
$320 + 62 = (382)_{10}$

2. $(77)_8 = (63)_{10}$

$(77)_8 = 7*8^1 + 7*8^0$
$56 + 7$
$= (63)_{10}$

- **Conversion of octol fraction to decimal fraction to decimal fraction.**
- $(0.64)_8 = (0.8125)$
- $(0.64)_8 =$
  $0*8^1 + 6*8^{-1} + 4*8^{-2}$
  $0 + 6*1/8 + 4*1/8$
  $3/4 + 1/16$
  $12 + 1/16$
  $13/16$
  $(0.8125)_{10}$

2. $(56.32)_{10} = (46.40625)_{10}$
$(56.32) = 5*8^1 + 6*8^0 + 3*8^{-1} + 2*8^{-2}$
$40 + 6 + 3*1/8 + 2*1/64$
$46 + 3/8 + 1/32$
$(46.40625)^{10}$

- **Ques – conversion of binary number to decimal number**.
- $(101010)_2 = (42)^{10}$
- $(101010)_2 = 1*2^5 + 0*2^4 + 1*2^3 + 0*2^2 + 1*2^1 + 0*2^0$
  $32 + 0 + 8 + 0 + 2 + 0$
  $= (42)_{10}$
- 2. $(1001001)_2 = (73)_{10}$

$$(1001001)_2 = 1*2^6+0*2^5+0*2^4+1*2^3+0*2^2+0*2^1+1*2^0$$
$$= 64+0+0+8+0+0+1$$
$$= (73)_{10}$$

- **Ques- conversion of binary fraction to decimal fraction**
- 1. $(101001.101001)_2 = (41.640625)_{10}$
- $(101001.101001)_2 = 1*2^5+0*2^4+1*2^3+0*2^2+0*2^1+1*2^{-1}+0*2^{-2}+1*2^{-3}+0*2^{-4}+0*2^{-5}+1*2^{-6}$

  $= 32+0+8+0+0+1+1/2+0+1/8+0+0+1/64$

  $= 41+1/2+1/8+1/64$

  $= 2624+32+8+1/64$

  $= (41.640625)_{10}$

- **Ques – conversion of hexa decimal to decimal number.**
- 1. $(D3C)_{16} = d*16^2+3*16^1+c*16^0$

  $= 13*256++3*16+12*1$

  $= 3325+48+12$

  $= (3385)_{10}$

- 2. $(1AA)_{16} = (426)_{10}$
- $(1AA)_{16} = 1*16^2 + A*16^1 + A*16^0$
- $256+10*16+10*1$
- $256+160+10$
- $(426)_{10}$

- **Ques – conversion of hexa decimal fraction to decimal fraction.**
- $(D3C.A2)_{16} = (3388.6325)_{10}$

  $D*16^2+3*16^1 C*16^0+A*16^{-1}+2*16^{-2}$

  $13*256+3*16+12*1+10*1/16+1/16*16$

  $= 3388+10/16+1/8*16$

  $= 3388+10/16+1/8*16$

  $= 3388+5/8+1/128$

  $= 433664+80+19/128$

  $= 433745/128$

  $= (3388.6328)_{10}$

  2. $(D3E.D)_{16} = (3390.8125)_{10}$

  $= (D3E.D)_{16} = D*16^2+3*16^1+E*16^0+D*16^{-1}$

  $= 13*256+48+14*1+13*1/16$

$= 3328+48+14+13/16$

$= 54240+13/16$

$= 54253/16$

$= (3390.8125)_{10}$

- **Ques – conversion of binary number to octol number.**
- $(1110)=(584)_8$

$1*512+1*64+1*8+0=584$ ans.

RULE:-the base of octal no is 8 but 8 is equal (=) to 2^3 three for to convert a binary number to octal nimber make three type binary group of the binary number.

Ex - right to left-After decimal is work.

Left to right-Before decimal is work.

3. $(101101101101.110101101101)_2= (5555.6555)_8$ ans

- **Conversion of octol number fraction to binary fraction**
- $(367421.11053)_8$

$=(011110111100010001.001001000101011)_2$

- **Conversion of binary number to Hexa decimal number.**
- $(101101)_2=(2d)_{16}$

$(00101101)= (213)_{16}= (2d)_{16}$ ans

2. $(1100100101)_2 = (325)_{16}$

$001100100101 = (325)_{16}$

- **conversion of binary fraction to hexa decimal fraction.**
- $(101101.11111)_{2 =} (2d.f8)_{16}$

$00101101.11111 = (2d.f8)_{16}$

2. $(101111010 1.1100100101001)_2$

$00101111.1100100100101001= (215.1294)_{16}$

$= (2f5.c94)_{16}$

- **RULE**- the base of the fraction hexa decimal number 16 bit 2^4 therefor to convert a binary number to hexa decimal make for byte binary group of the binary number.
- Conversion of Hexadecimal fraction to Binary fraction-

1. $(D3FA48.18CD86)_{16}=$

$(110100111111101001001000.00110111100110000110)_2$

2. $(ACD.B4)_{16}= (101011001101.101101)_2$

A   C   D   B   4
1010 1101 1101 1011 0100

- **Conversion of Octal number to Hexadecimal number-**
    1. Octal number
    2. Binary number
    3. Hexadecimal number

1. $(235)_8 = (9D)_{16}$
   $(235)_8 = (010011101)_2$
2. $(462)_8 = (132)_{16}$
   $(462)_8 = (100110010)_2$
   $(000100110010) = (132)_{16}$

- **Conversion of Octal fraction to Hexadecimal decimal-**
1. $(462.571)_8 = (132.BC8)_{16}$
   $(462.571)_8 = (100110010.101111001)_2$
   $(000100110010.101111001 0000)_2$
   $= (132.1128)_{16} = (132.BC8)_{16}$
- **Conversion of Hexadecimal number to octal number-**
  RULE-   Hexadecimal number
            Binary number
            Octal number
1. $(AD4)_{16} = (5324)_8$
   $(AD4)_{16} = (101011010100)_2$
   $(101011010100)_2 = (5324)_8$
- **Conversion of Hexadecimal fraction to Octal fraction-**
  $(AD4.35)_{16} = (5324.152)_8$
  $(AD4.35)_{16} = (101011010100.00110101)_2$
  $= (10101101000.00110101010)$
  $(5324.152)_8$
- ❖ **BINARY ARITHMATICS:-**
  1. Addition
  2. Subtraction
  3. Multiplication
  4. Division

ADDITON:-

Binary addition

0+0=0
1+0=1
0+1=1
1+1=0   Plus a carry to next high column

1.   101   2.   1101   3.   1011   4.   1111
     +100   +1101   +1111   +1111
     1001   11010   11010   11110

5.   110110101
     +111111111
     110110100

SUBTRACTION:-

Binary Subtraction

0-0=0
1-0=1
1-1=0
0-1=1 borrow with 1from next column

1.   110   2.   1001   3.   1000   4.   101010
    -101   -111   -111   -11111
     001   010   001   01011

5.   1110
     -0101
     1001

MULTIPLICATION:-

Binary Multiplication

```
0*0=0
1*0=0
0*1=0
1*1=1                                      3.  1110101
    1.     1111    2.     11111              *11111
            *101            *1111           1110101
            1111           11111            1110101*
           0000*          11111*            1110101*
          1111*           11111*            1110101*
         1001011          11111*            1110101*
                         11110001          1110001011
```

DIVISION:-

Binary division

0/0=0
1/1=0

```
    1. 11)100001(1011      2.    100)100001(1000.01
          11                           100
        00100                        ***00100
          11                              100
        0011                            ***
          11
        ***
    3. 101)100001(110.1    4.    10)11101(1110.1
         101                         10
        00110                        011
         101                          10
        00110                        010
         101                          10
         001                        **10
                                       10
                                      **
```

COMPLEMENT:-

- ➤ It is a method.
- ➤ It is a rules or producer.
- ➤ Complements are used in digital computer for simplifying the subtraction and for logical calculation.
- ➤ There are two types of complements for each base is r.
  1. (r-1)'s complement
  2. r's   complement

  1. (r-1)'s complement :-
     Given a number n is base, digit n (r-1)'s complement of n is defined as $(r^n-1)-n$.
  2. r's complement:-
     given a number n is base r a nd digit
     n,r's complements n defined as $(r^n-n)=(r^n-1)-n+1 =(r-1)$'s complement+1.
- ➤ In the case of decimal number base is equal +10.
     There are two complements:-
1. 9's complement
2. 10's complement
1. 9's complement- 9's complement defined as $(10^n-1)-N$
   where n= digit
         N= number

   For example: - 1. $(2356)_{10}$
                 9's complement
                   N= 2356
                    n= 4
                    r =10
       9's complement = $(r^n-1)-N$
                 $= (10^4-1)-2356$
                 $= (10000 -1) – 2356$
                 $= 9999-2356$

$$= 7643 \text{ Ans}$$

10's complement $= (r^n - N)$
$$= (10^4 - 2356)$$
$$= (10000 - 2356)$$
$$= 7644 \text{ Ans}$$

2. $(4678)_{10}$
   N= 4678
   n= 4
   r = 10
   9's complement = as complement + 1
   $$= 5321 + 1$$
   $$= 5322$$

➤ In the case of binary number:-
1. 1's complement
2. 2's complement
1. 1's complement: - 1's complement as defined as $(2^n - 1) - N$.
                     n= digit
                     N= Number.
2. 2,s complement: - 2,s complement as defined as $(2^n - 1) - n$
                     n=digit
                     N=number

   Ex:- 1. $(1010)_2$
                     N= 1010
                     n= 4
                     r=2
1, complement $= (r^n - 1) - n$
              $= (2^4 - 1) - 1010$
              $= (16-1) - 1010$
              $= 15 - 1010$
              $= 1111 - 1010$
              $= 0101$
2,s complement $(r^n - n)$
              $= (2^4 - 1010)$
              $= (16 - 1010)$

$$= (16-10)$$
$$= 6$$
$$= 0110$$

2. $(11001)_2$

$$= n= 11001$$
$$= n= 5$$
$$= r=2$$

1^s complement $– (r^n-1)-n$
$$= (2^5-1)-11001$$
$$= (32-1)-11001$$
$$= 31-25$$
$$=6$$
$$=00110$$

2^s complement $= 1^{,s}$ complement $+1$
$$= 00110+1$$
$$= 00111$$

BCD(Binary coded decimal):-

➢ it stands for binary coded decimal .

➢ the binary coded decimal (bcd) is one of the early computer code.

➢ It is based on the idea of converting each digit of a decimal number into its binary equivalents the entired decimal value into a pure binary form.

➢ It converts each digit in -4-bit instil.

➢ That means it convert $2^4=16$ character.

➢ This makes conversion process easier.

➢ The BCD equivalent of each decimal digit each decimal digit each in the figure.

➢   ## 4-BIT BCD:-

Decimal no.	BCD
0	0000
1	0001
2	0010

3	0011
4	0100
5	0101
6	0110
7	0111
8	1000

Ex: - Binary conversion (BC)-

$(42)_{10}= (101010)_2$

But conversion it in BCD

$(42)_{10}= (01000010)_{BCD}$

➢ 4-Bit BCD code represent with adding zone position of 2-Byte=2^6=64 character

➢ 6-Bit BCD represented 64 characters such as 26 letters, alphabet, 28 other character or 10 numbers.

6-BIT BCD:-

CHARACTER	ZONE	BCD
A	11	0001
|		
I	11	1001
J	10	0001
|		
R	10	1001
S	01	0010
|		
Z	01	1001
1	00	0001
|		
9	00	1001
|		
0	00	0000

CHARACTER BCD TABLE:-

CHARACTER	ZONE	BCD
A	11	0001

B	11	0010
C	11	0011
D	11	0100
E	11	0101
F	11	0110
G	11	0111
H	11	1000
I	11	1001
J	10	0001
K	10	0010
L	10	0011
M	10	0100
N	10	0101
O	10	0110
P	10	0111
Q	10	1000
R	10	1001
S	01	0010
T	01	0011
U	01	0100
V	01	0101
W	01	0110
X	01	0111
Y	01	1000
Z	01	1001

NUMBER BCD TABLE:-

NUMBER	ZONE	BCD
1	00	0001
2	00	0010
3	00	0011
4	00	0100

5	00	0101
6	00	0110
7	00	0111
8	00	1000
9	00	1001
10	00	0000

EBCDIC(Extended binary coded decmal interchange code):-

- ➢ EBCDIC stands for extended binary coded decimal interchange code.
- ➢ The major problem of BCD is that only $64(2^6)$ different character in it.
- ➢ This is not sufficient for providing decimal number (10), lower case letter (28), upper case letter (28) and other special character (28).
- ➢ Hence BCD code stands 6-Bit code to 8-Bit code.
- ➢ The added 2-Bit are used at additional zone bit expend in the zone to four byte this is called decimal interchange code.
- ➢ In this code $2^8=256$ different character can be represented.

8-Bit EBCDIC:-

CHARACTER	ZONE	EBCDIC
A	1100	0001
|		
I	1100	1001
J	1101	0001
|		
R	1101	1001
S	1110	0010
|		
Z	1110	1001
0	1111	0000
|		
9	1111	1001

NUMBER EBCDIC TABLE:-

NUMBER	ZONE	EBCDIC
0	1111	0000
1	1111	0001
2	1111	0010
3	1111	0011
4	1111	0100
5	1111	0101
6	1111	0110
7	1111	0111
8	1111	1000
9	1111	1001

CHARACTER EBCDIC TABLE:-

CHARACTER	ZONE	EBCDIC
A	1100	0001
B	1100	0010
C	1100	0011
D	1100	0100
E	1100	0101
F	1100	0110
G	1100	0111
H	1100	1000
I	1100	1001
J	11O1	0001
K	11O1	0010
L	11O1	0011
M	11O1	0100
N	11O1	0101
O	11O1	0110
P	11O1	0111
Q	11O1	1000

R	11O1	1001
S	1110	0010
T	1110	0011
U	1110	0100
V	1110	0101
W	1110	0110
X	1110	0111
Y	1110	1000
Z	1110	1001

ASCII CODE:-

- ➤ ASCII stands for American standard code for information interchange.
- ➤ It is widely by several computer manufacturers as three computer interchange code.
- ➤ This code in popular in data communication and it used almost excluvely to represent data eternally in micro computer.
- ➤ ASCII is of two type :-(1) ascii-7 (2) ascii-8.

ASCII-7

- ➤ 7- Bit code which allow $128(2^7)$ different character the first 3-bit are indicate zone bit and last 4=bit indicates the digit.

ASCII-8

- ➤ 8-bit code which allow which $256(2^8)$ different character. The first 4-bit are used as zone bit and last 4-bit indicates as digit it is extend version of ascii-7.

TABLE OF ASCII-7

CHARACTER	ZONE	DIGIT
0	011	0000
|	|	|
9	011	1001
A	100	0001
|	|	|
0	100	1111

P	101	0000
|	|	|
Z	101	1010

ASCII-8

CHARACTER	ZONE	DIGIT
0	0101	0000
|	|	|
9	0101	1001
A	0101	0001
|	|	|
0	0101	1111
P	1010	0000
|	|	|
Z	1010	1010

END

UNIT-4

➢ **Overview of computer architecture and origination:-**
➢ **Computer origination:** - It concern with the hardware component operate and the way they are connected together to form the computer system.
➢ **Computer architecture:** – It concern with the major structure and behaviour of the computer as seen by user. It includes the information format, the instruction set and technique for address memory.
➢ **Basic function of computer: -** All the computer performs the following basic function.
    (1) Inputting.
    (2) Storing.
    (3) Processing.

(4) Outputting.

(5) Controlling.

➢ **Inputting: -** Saving data and instruction into the computer system is called inputting.

➢ **Storing:-**Saving data instruction make than reading available for initial or additional process as and when required.

➢ **Processing: –** Performing arithmetical information.

➢ **Outputting: –** The process of producing useful information or result for the user such as a printed report on visual display.

➢ **Controlling: -** Directly the member and sequence in which all the above operation and perform.

➢ **Basic block diagram of computer:-**
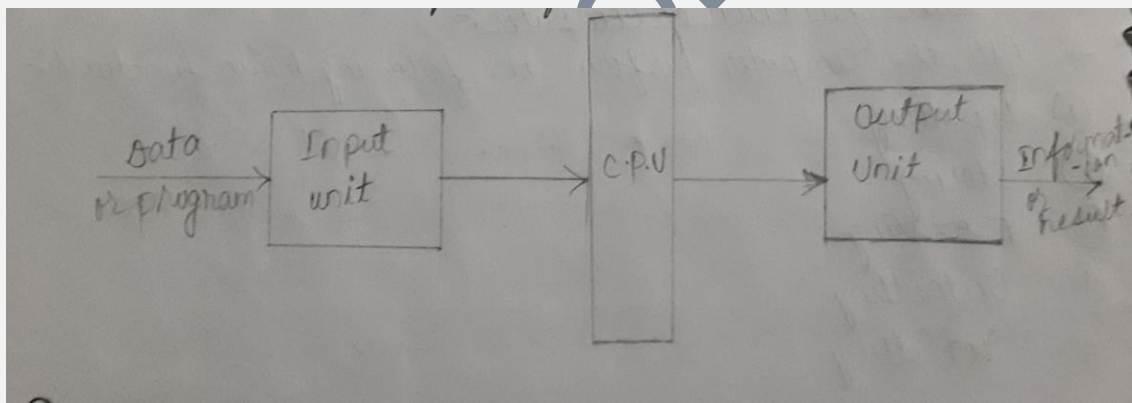
➢ **Input unit:-** Data and instruction must enter the computer system before any computer can be performing. The task is performed by the input unit for ex: - data are entered from a keyboard in a manner similar to typing ex: - keyboard, mouse, joystick, and scanner.

➢ **Central processing unit(C.P.U):-**Central processing unit is a mind and heart combined with the central nerves system of a computer, so the computer perform function similar to cerebellum and cardio combine of a human body . It processes the data and storage.

> **Output unit:-** The job of an output unit the just reverse of that option input unit it supply the information obtain from the data processing to that outside of computer system . It converts the information to acceptable form.
> **Ex** – Monitor printer, floppy disk, and plotter.
> **Figure:-**

Sturactual componentd of computer and C.P.U with interconnection:-
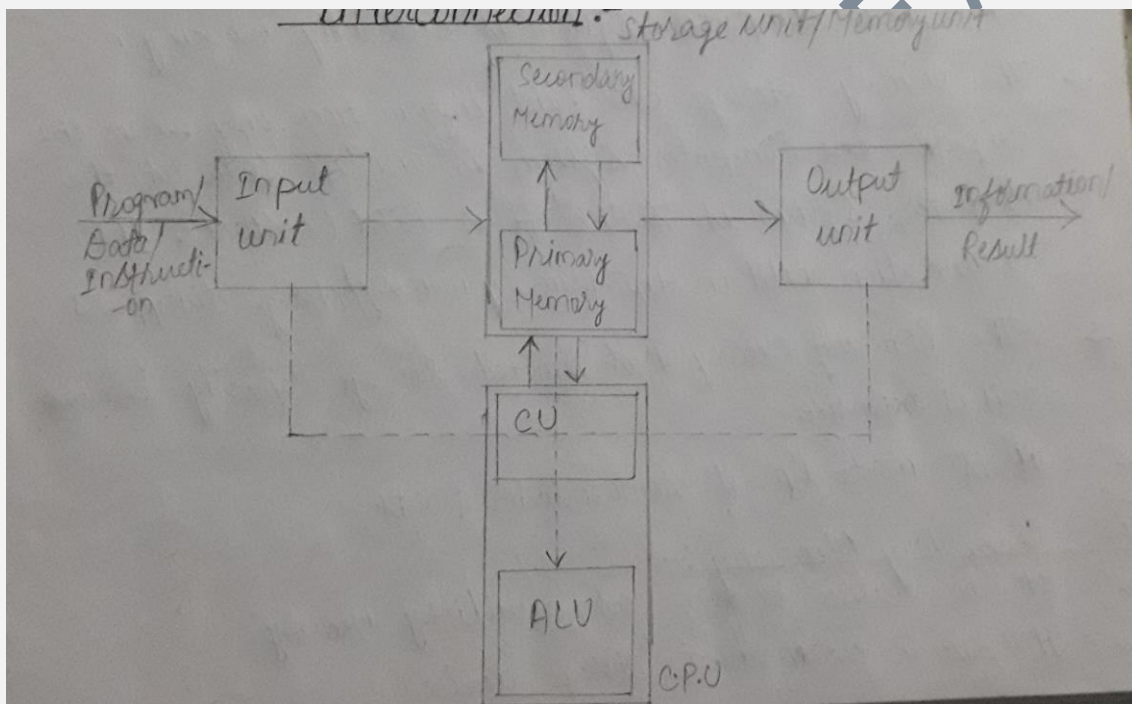
> **Storage unit**:– Data and instruction which are entered into computer system through input unit have to be stored in the computer system before actual processing start it provide space for storing data or instruction. Space for intermediate result and for final result.

The storage unit divided into two parts.
1. Primary memory.
2. Secondary memory.

- **<u>Primary memory:-</u>**
- It is also known as main memory real memory or volatine memory.
- It is used to hold peace of information and data , which the computer system is currently switch on.
- The primary memory can hold information and data , only which the computer system is on as soon as the computer system switch off or reset the information held in the primary memory dispatched.
- This memory has limited storage capacity because it is expensive.
- It is made up semi conductor material
- **<u>Secondary memory: –</u>** It is also known as auxiliary memory.
- It is a permanent storage device secondary storage much cheaper compression of primary memory.
- It can hold information even then the computer system switched of or reset.
- The secondary storage holds the data and information of the computer system is not working on currently but needs to hold then for the processing letter.
- **<u>C P U:-</u>** C.P.U is a mind and heart combine with the central nervous system of a computer, so the computer perform function similar to cerebellum and cardiac and combine function of a human body. It has two parts:-
  1. A.L.U.
  2. C.U.
- **A.L.U:-** A.L.U stands for arithmetical logical unit.
- During data processing the actual execution of the instruction takes place in the alu of a computer system.
- It perform and processed all the expression arithmetical (+, -,*) and logical (<,>, =) operation.

- **C.U:-** C.U stands for control unit.
- The control unit of a computer manages or the operation of a computer system that is how dose the input device know that it is the time for it to enter the data and storing how dose the final result given by the output unit.
- It obtains the instruction from the program stored in the main memory.
  - **MAJOR COMPONENT OF COMPUTER:-**
- Computer is not a single operator's machine and a computer system is not some thing that just dose calculation the word computer means a group of VIROUS machine which are utilised for processing a set of program a computer has two major parts.
    1. Hardware.
    2. Software.

- **Hardware:-**
- It represented the physical and tangible component of the computer system
- The part which can be touched and seen.
- It includes.

    (A) – Input device.
    (B) - Output device.
    (C) - C p u.
    (D) - Storage device.

- Electronic circuit consisting of resistor wires, I.C etc.
- **SOFTWARE:-**
- It is a set of programme associated with the computer system. S/w just like a car without petrol and a TV without film.
- It is tangible in nature.
- s/w are two type:-
    1. System software.
    2. Application software.

- **System software:-**
- By the system means computer system.

- ➤ It is an s/w for system.
- ➤ It control and maintain the performance of the computer system.
- ➤ It is provide by the computer manufacturer or supplier for the computer system.
- ➤ Certain ex ample of system s/w:– (A)Operating system (os) (B)Translator (C) Device driver (It is used for controlling the perform of the desired device.).

➤ **Application software:-**
- ➤ It is software for the user.
- ➤ Application is provide by the computer manufacturer or supplier for the user to works in it.
- ➤ It is also develop by the user for the for itself or other ex: - payroll system, student, information, online, examination system, office, automation, system.
- ➤ Certain examples of application s/w – MS- office, visual studio.

➤ **Computer language:**–
- ➤ A language that is acceptable by the computer system is called computer language.
- ➤ It is also known as programming language.
- ➤ It can be classified as following categories.
    1. Machine language.
    2. Assembly language.
    3. High level language.

➤ **Machine language**:-
- ➤ The entire computer can be program to understand much different computer language. There is only one language that is directly understood by the computer system without any translation program this language is known as machine language.
- ➤ Machine language of a computer is written as either binary 1's or 0's.
- ➤ The circuitly of a computer wired in a manner that it recognizes the machine language instruction immediately

and convert them into electronic single needed to be executed.

- **Assembly language:**-
- Assembly language programming introduces help in overcoming the above limitation of machine language programming.
- A language which allows data and instruction to be represented and storage by alphabet or symbol inserted of a number.
- A language which is represented in the form of alphanumeric code.

- **Limitation of machine language:-**
   Programming in machine language is difficult and error prone because programmers needs to write numeric codes for the instruction in the computer system.
   A programmers needs to store location of data or instruction in numeric form.

- **Both machine and assembly language have following limitation:-**
- They are machine dependent.
- They do not require programmer to have a good knowledge of internal structure computer system.
- It is difficult to programming and error.
- This limitation is take care by high level language.

- **High level language:**-
- They are machine independent.
- They do not require programmer to have anything to know about internal structure of the computer.
- It is not too much difficult and error prone.

- **Translator:**–
- It is a software or program which translates or converted the assembly language or high level language into the computer language that is machine language. There is three type of translator.

1. Assembler.
2. Compiler.
3. Interpreter.

(1)Assembler:–

➢ It is a program or software or system software or translating program which translator or converted the assembly language into machine language which is directly acceptable or excute by the computer system.
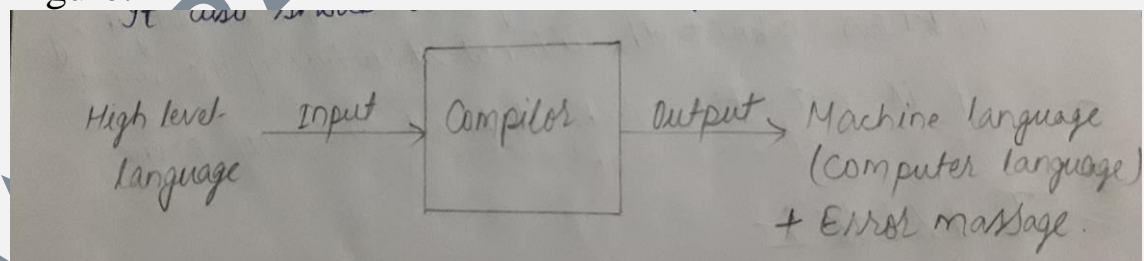
Figure:-
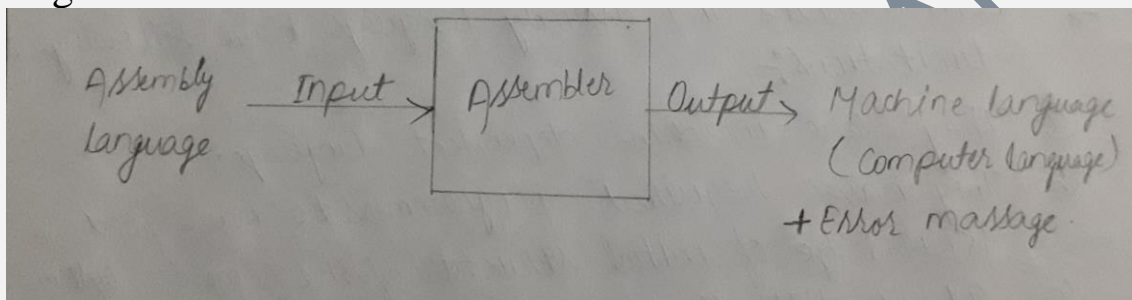
(2)Compiler:–

➢ It is program or software or system software or translating program or type translator which converted the high level language into machine language.
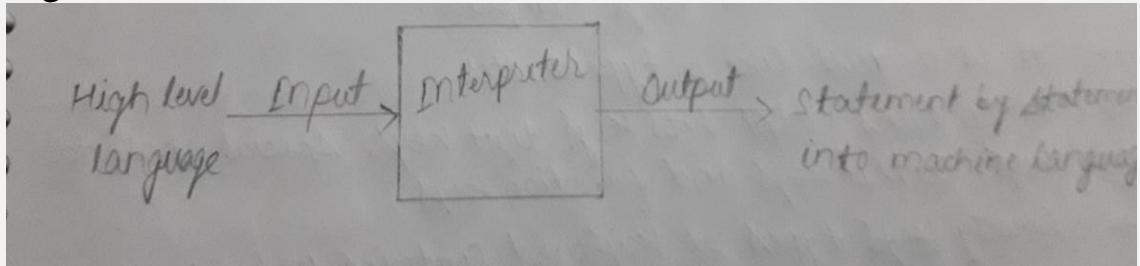
Figure:-

(3)Interpreter: –

➢ It is program or software system software translation program which translate statement of a high level language into machine language line by line/statement by statement.

Figure:-

Input unit:-

➢ It is a part of computer system.
➢ Program and data are entered into computer system with the help of input unit.
➢ Certain example of input unit: - (A) keyboard,(B)mouse, (C)joystick,(D)Scanner and its types.

➢ **Keyboard:-**

➢ It is an input device.
➢ Data and program entered a computer system through a keyboard.
➢ It is attached with the micro computer and terminals of mini computer and large computer.
➢ It is just like a type writer.
➢ It contains alphabet keys, control, keys, digit key, special character keys, and function keys.
➢ QWERTY type of keyboard contains 102/105 keys.
➢ When a keys is pres and electronic signal is produced through an electronic circuit when is inside the keyboard encoder.
➢ It is connection oriented and connection less.

Figure.

➢ **Mouse:**–

➢ It is an input device.
➢ A mouse is also called a pointing device.
➢ It is held in one hand and moved across a flat surface.
➢ It movement and direction, movement is read by two rotating on the under side of the mouse the wheel have x-axis at right angle.
➢ Each wheel is connected to a shaft encoder which emits electrical pulses for every increment of the wheel.
➢ A mouse has one or more button on the surface the control purpose.
➢ The mouse is use to draw sketch diagram etc on the screen.
➢ The mouse is also use to edit a text mouse is used to only GUI operating system.
Figure.

SANJEET KUMAR SINGH, BCA SEM-1, ROLLNO.-04(2017-20)

➢ **<u>Joystick:</u>** –
➢ It is an input device.
➢ It is a pointing device.
➢ It is work like a mouse.
➢ The movement is based on spherical ball to make movement easier. The spherical ball moves in socket has a stick mounted.
➢ The stick can be move forward pr backward and left or right in move at position the cursor at the desire position.
➢ Joy stick consist of a button on the top is provide to select option.
➢ Typical uses of a joy stick include video games flight simulators training simulators and remote control.

➢ Scanner:–

➢ It is a special part of input device.

➢ They are capable of entering data and information directly into the computer system.

➢ The main advantage of direct entering of information is that users do not have to press any key for the information. This provides faster and moves accurate data entry.

➢ Scanner are divided into two part:-
   1. Optical scanner.
      (a)OCR.
      (b)OMR.
      (c)OBCR.
   2. Magnetic ink character reader (MICR).

➢ Optical scanner:–

➢ Optical scanner is capable of reading information recorded on the paper employing light source and light sensor.

➢ The information to be scan is type written information code and ink or pencil makes or information codes in the base.

➢ It is divided into three types:-
   1. Optical character reader (OCR)
   2. Optical mark reader (OMR)
   3. Optical bar character reader (OBCR)

1. OCR:-

➢ O C R stands for optical character reader.

➢ O C R scanner scan alpha numeric character printed pr type written in a paper.

- It may be a hand held scanner or page scanner to scan light reflection to right right reflection light to convert binary data.
- O C R can scan several thousand of character per second.
- It is used to in large volume application such as computer oriented prepared by public utility.


OCR- 9 fonts
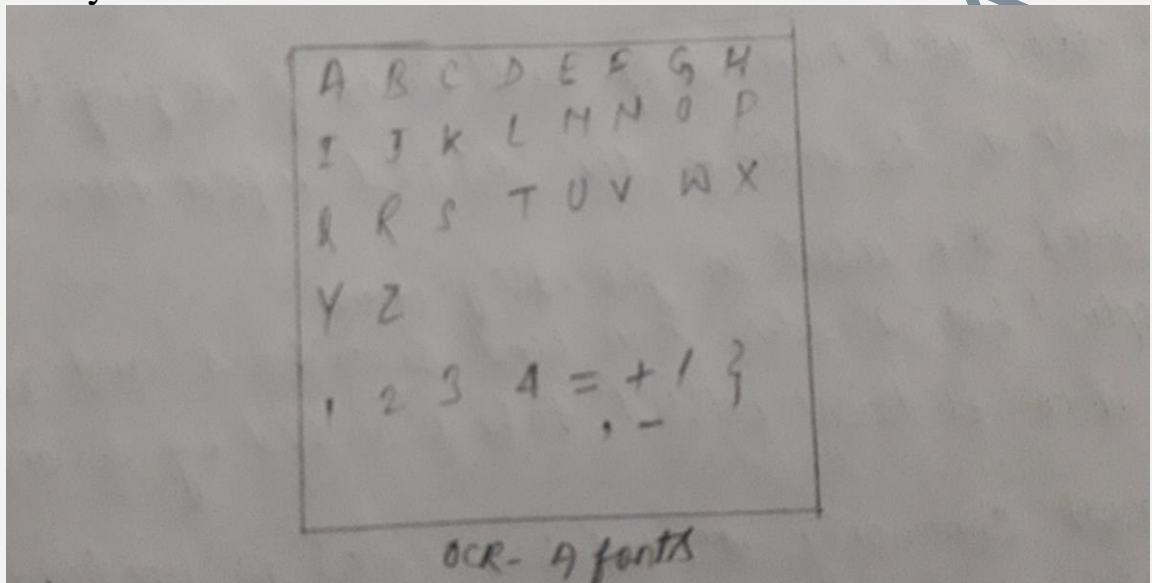
2. OMR:-
- Omr stands for optical mark reader.
- The special mark such as square or bubbles are prepared on the examination answer sheet.
- The user fill these square or bubbles with the soft pencil, ball point pen to include there choice.
- These marks are scan by OMR and the corresponding signals are sent to the processor.
- If the mark is present it includes the amount of reflected light.
- The change in the amount of reflected light is used to scan the presence of mouse.

➢ It is used in population sare market share objective answer sheet.

Pre- Printed answer sheet
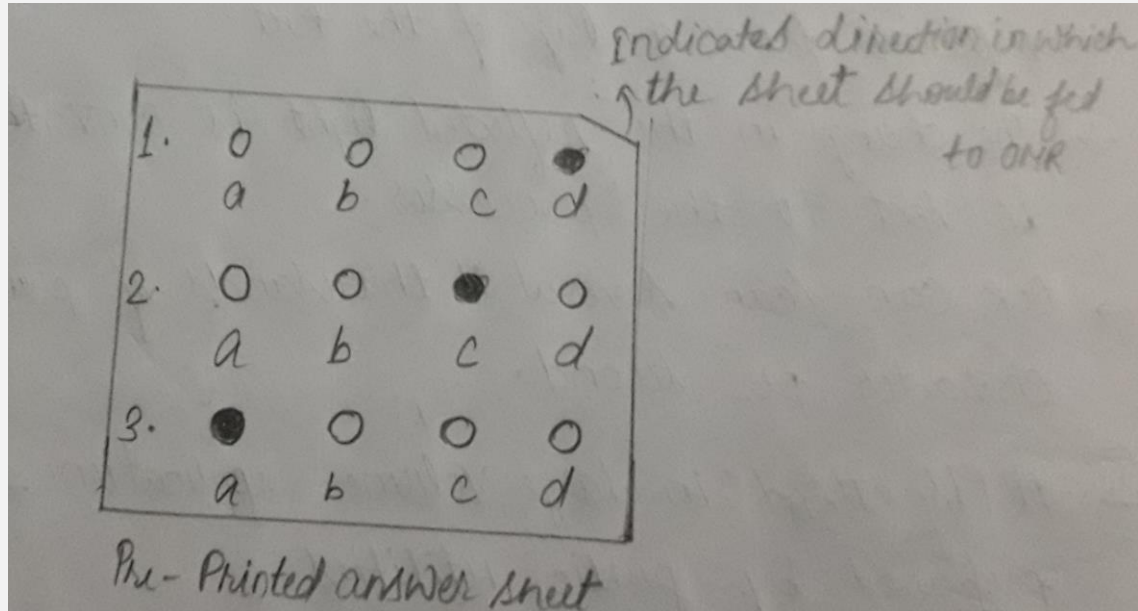
➢ **OBCR:-**
➢ OBCR stands for optical bar code reader.
➢ This method use in number of bar (line) of varying thickness between then to indicate the desired information.
➢ Bar code are used in grossary item an optical bar code reader can read such bar line and convert then in to electronic pulses to be processed by a computer .
➢ The most commonly bar code reader is used in u p c.
➢ U p c stands for Universal Product Code.
➢ The UPC code uses a seals of vertical bar line of varying thickness.
➢ These bars are scan as thirteen (13) digit.the first six digits indicate the supplier or menufacture of the item and second six digits indicate the individual product.
➢ The code also contains a check digit to insured that the read is correct or non-correct product.

A B C D E F G H I J K L M
N O P Q R S T U V W X Y
Z 1 2 3 4 5 6 7 8 9
. , : ; = + | $ * & | , -- { } %
?

FIGUR:-

Fig – An Example of UPC bar code
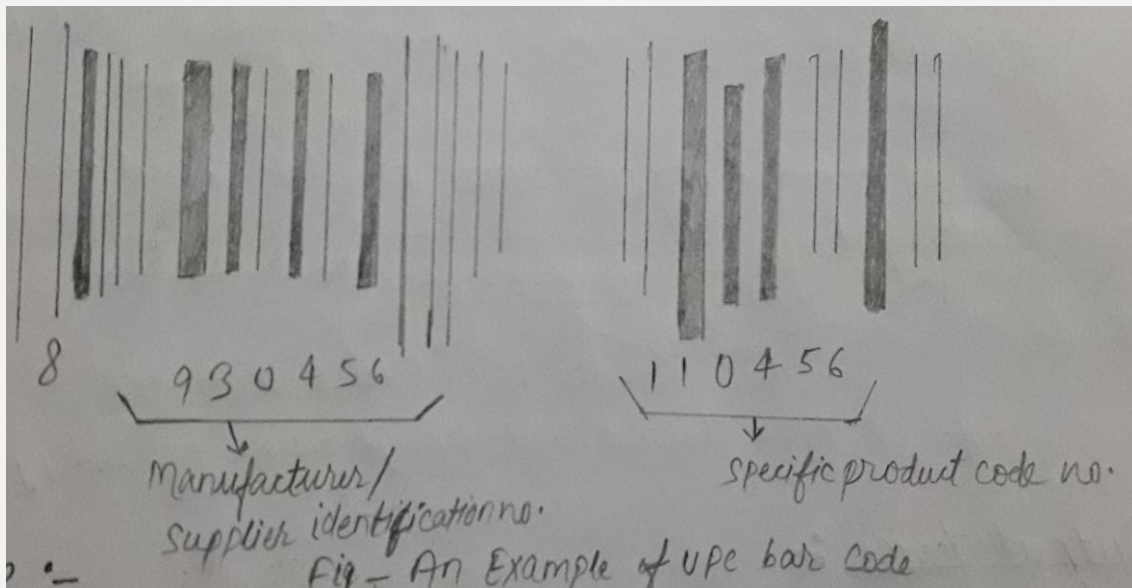
➢ **MICR:-**

➢ MICR stands for magnetic ink character reader .

➢ It is widely used by bank to process large value cheque or deposit form.

➢ Special ink called magnetic ink(which contain iron oxide particles) is used to written character in the cheque or deposit which is detected by MICR.

➢ MICR is capable of process these cheque or deposit form.

➢ When a cheque is entered in to m I c r it passes through a magnetic field. The iron oxide particles are magnetized under the magnetic filed .the reads head reads the characters written on the cheque or deposit form with the magnetic ink.

➢ Up to 2600 cheque or deposit form are processed by m I c r within one

minutes.

Fig. A Bank cheque that employs MICR technology
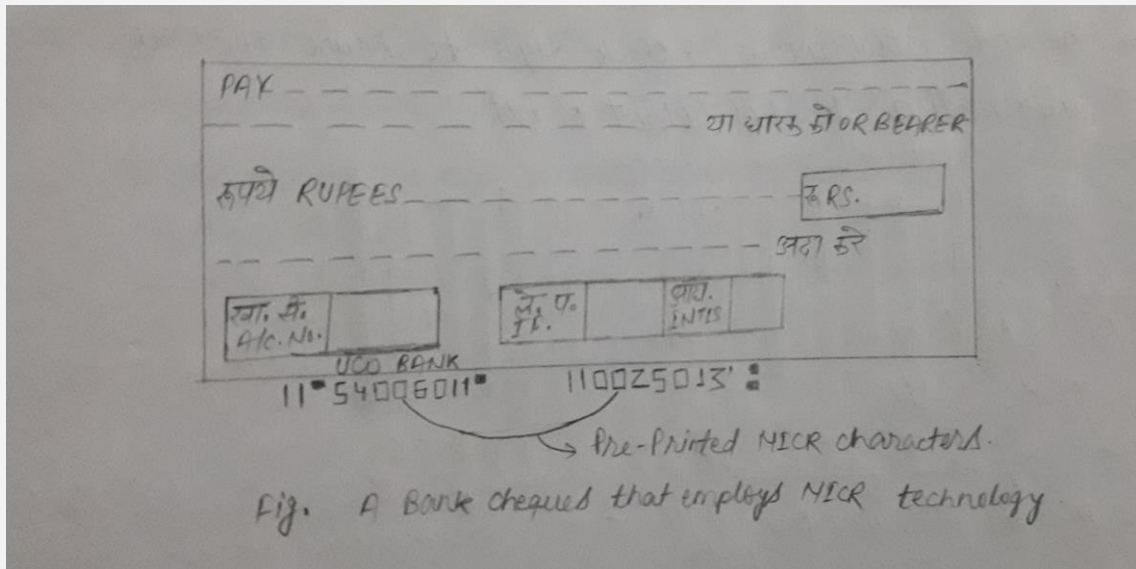
➢ **Output device:-**
➢ It is a part of a computer system.
➢ Different types of message, picture, image or text display through output device.
➢ Example of output device:–
   (1) MONITER (VDU).
   (2) PRINTER.
      (A)Impact printer.
        (a)Dot matrix printer.
        (b)Line printer.
        (p)Drum printer.
        (q)Chain printer.
      (B)Nonimpact printer.
        (a)Inkjet printer.
        (b)Laser printer.

➢ **Monitor(VDU):-**
➢ It is an out put device. It is just like a TV. monitor is also called VDU.it size is margined diagonal length of screen monitor are available 9",10",14",17",and even in 21",in size it shows text or picture in colour or black and white depending upon your type colour .colour monitor more coastally than

black and white monitor . What ever you type on the keyboard. You can see it on the monitor.

➢ **Printer:-**
➢ Printer is most popular device they provide information an armament readable form on the paper. printer can be classified-
   1. Impact printer
   2. Nonimpact printer

   ➢ **Impact printer: -** Impact printer is use electro mechanical mechanism that calls hammer or collection of pins strike against a ribbon and paper to print the text.

   ➢ **Nonimpact printer: -** It doesn't use any electro mechanical mechanism head or strike against ribbon and paper. They uses third chemical electro conductivity laser bam or inkjet technology for printing the text.
   ➢ Usually the non- impact printer is faster than impact printer.
   ➢ The disadvantage of none impact printer it produce a signal copy of the text where impact printer produce multiple copy of the next.

   ➢ **Dot matrix printer:-**
   ➢ It is a character printer which prints one character at a time.
   ➢ Dot matrix printers from the character and all kind of imege as a pattern of dots.
   ➢ It printer has a print head which move horizontally right to left or left to right across the paper.
   ➢ The printer heads contain collection of pins which can be activated independent of each other to extend and strike against an inked ribbon to room a pattern of dots.
   ➢ It printers is an impact printer because they printed by hammers or pins on the ink ribbon to give the expression on the paper.
   ➢ It can be used to produce multiple copies using carbon or equivalent.
   ➢ It prints 30-6000 characters per second.

➢ **<u>Inkjet printer</u>**:-
➢ Inkjet printer are character printer which term of character and all kind of image by spraying small droop up ink on the paper.
➢ The printer head of inkjet printer contain up 64 tinny nozzles that can be hottest of selectively in a few micro second by an integrated circuit resistor when the resistor heats up the ink near it vaporizes and is ejected through the nozzle and makes a character on the paper.
➢ The printers head move horizontally to paint – the text or image on the paper.
➢ It is a non-impact printer because they print text of image using spry ping on the paper does not with collection of pins or ribbons.
➢ Inkjet printer produces higher quantity output than dot matrix printer.
➢ It printers provides higher quantity output than dot matrix printer.

➢ It prints 30-400 character per second.

➢ **Laser printer**:-
➢ It is an impact printer it is a page printer.
➢ The printer uses laser or some light source to produce an image into a photo sensitive drum.
➢ The laser printer produces higher quality output.
➢ These printers are expensive and required preoodic maintainence.
➢ Low speed laser printer produce up to 30 pages per minute and use with micro computer.
➢ High speed laser printer produces up to 400 pages per minute and use with mini or large computer.

> The laser printer produces high quality output.

> **<u>Line printer</u>**:-
> It is a part of impact printer.
> Line printer print one line at a time.
> It's printing speed line in the range of 300-3000 per minute.
> It use for large volume of printing work.
> It may be used with minicomputer and mainframe computer.

> ## **Drum printer**:-
> ➢ It is a part of line printer.
> ➢ A drum printer consists of cylindrical drum a drum printer uses rapidly rotating drum. Cylinder which contains a computer set raised character an each band around the cylinder.
> ➢ Each character position along the text line contains a band of raised character set.
> ➢ This is magnetically driven hammer each character position on the line.
> ➢ The printer receives all character to be printed in one line from the processor.
> ➢ The hammer hits the ribbon and paper against the desire character when it come n the printing option.
> ➢ It is an impact printer it noise level is high.
> ➢ It speed varies from 200-2000 line per minute.
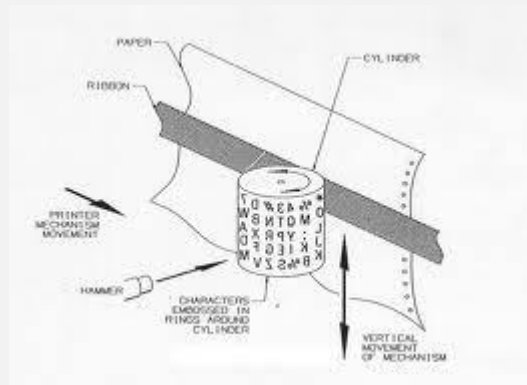
Total no of band is equal on the maximum number of character on a line.

➤ **Chain printer**:-
➤ It is a part of line printer.
➤ A chain printer uses a rapidly rotting chain which is called print chain.
➤ The print chain contains characters.
➤ Each link of the chain is a character font.
➤ Magnetically driven hammers are located in each print position.
➤ The printer receives all the characters to be printed in on line from the processer.
➤ The printer prints one line at a time.
➤ It is an impact printer.
➤ The noise level of the printer is high.
➤ It's speed lies in the range of 400-2400 lines per minute.
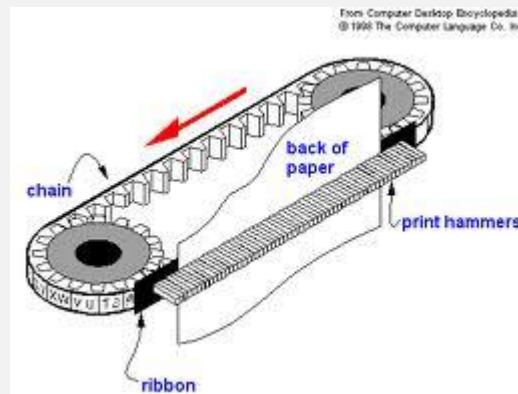
> **Storage Unit**:-
  Primary memory.
  Secondary memory

> **primary memory**:-
  1. Ram- 1. static ram
       2. Dynamic ram.
  2. Rom- 1. Prom- Eprom- 1. Eeprom 2. Uverom.

> **Secondary memory**:-
  1. Sequential access secondary memory (Magnetic type)
  2. Direct access. 1. Optical disk. 2. Magnetic disk.

> **Storage unit:-**A computer uses two types of storage.
  (a)Main memory.
  (b)Secondary memory.

(1)Main memory:-Main memory temporally stored instruction or data to be execute the computer the primary storage hold information only when the computer system is on. As soon as the computer system switched off or reset, the information held in primary storage is disappeared. Primary memory is divided into two parts:-
(a)RAM.
(b)ROM.

(2)Secondary memory: - It is used to take care the limitation of primary memory. It is the permanent storage device which retain (reserve) information even then the computer system is switched off or reset.

- **RAM: -** Ram stands for random access memory. It is main memory and temporarily read and writes memory of a computer. The desire data which is processed and available in the main memory for the user. It is divided into two parts.
  1. Static ram.
- It is written stored information only as long as the power supply is on.
- It has a very high speed.
- It is expensive.
- It consumes more power.
  2. dynamic ram-
- Dynamic ram losses it stored information is very short time (a few millisecond) even through the power supply is on.
- It is cheaper.
- It consumes less power.
- **Static RAM and Dynamic RAM:-**
  - **Static RAM**:-Static RAM retains stored information as long as the power supply is on.
    It has very high speed.
    It consumes more power.
    It is costlier.

  - **Dynamic RAM:-**Dynamic RAM loses its stored information in a very short time (a few milliseconds.) even though the power supply is on.
    It has low speed.
    It consumes less power.
    It is cheaper.

- **ROM** :-
- Rom stands for read only memory. Program held in Rom are called firmware. They are stored information permanently in the rom. Rom are read for used when the computer is switch on. The user cannot write into a rom. It

contents are written into at manufacturer time it store function such as cosine, sine, square, root, log, exp... etc.

➢ **PROM** :-
➢ PROM stands for programmable read only memory. Prom becomes after a rom and it only possible to read the stored information permanently even if power supply is switch off program and data stored in it.

➢ **EPROM**:-
➢ EPROM stands for erasable programmable read only memory. Once information stored in ROM or PROM chip can not be erased however another type of EPROM is develop which erased the stored information and restore the information or program.

➢ **EEPROM:** – Erased electrically high voltage electricity.

➢ **UVEPROM (Ultra violet erasable programmable rom):-** erased by ultra violet light.

➢ **Secondary memory**:-
➢ **Sequential memory**: - A sequential memory access storage device is one in which the location desired may be sequential through the location.

Ex – magnetic tape.

➢ **Direct access memory**: - The information is stored or available in any order.
➢ It is a direct access memory which is made up of optical fibre.

➢**Optical disk:-**It is a direct access device which is made up of optical fibre. CD-ROM, WORM (WRITE ONLY READ MOD).

➢ **Magnetic disk**:-
➢ It is a direct access secondary memory device which is made of magnetic cores.

Ex: - hard disk, floppy disk,

> **Track**: - The surface of a disk is divided into number of concentric circle which is called track.


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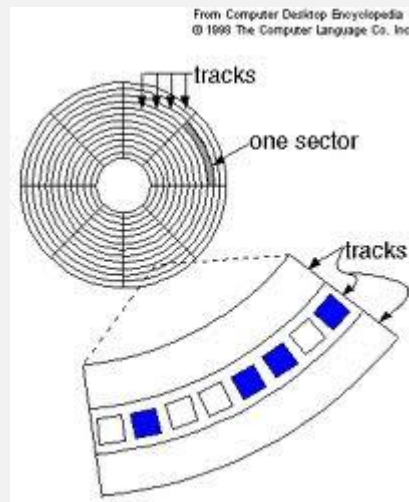
> **Sector: -** Each track is further sub divided into number of segment which is called sector.
> **Seek time**: - It is the time taken to position of the read write head from the one track to another track.
> **Latency time**: - It is time taken to another sector of the same head.
> **Access time**: - Seek time + latency time. If the head is fixed the seek time is equal to "o" therefore access time=latency time.
> **Cache memory**:-
> Cache memory pronunciation as cash memory.
> Cash memory is strimally very fast and mall memory.

➢ It is in between c p u and main memory and its access time is closed to the processing speed buffer between c p u and main memory.
➢ It is used to temporarily store active data and instruction during processing speed of c p u.

It is very expensive than other memory.
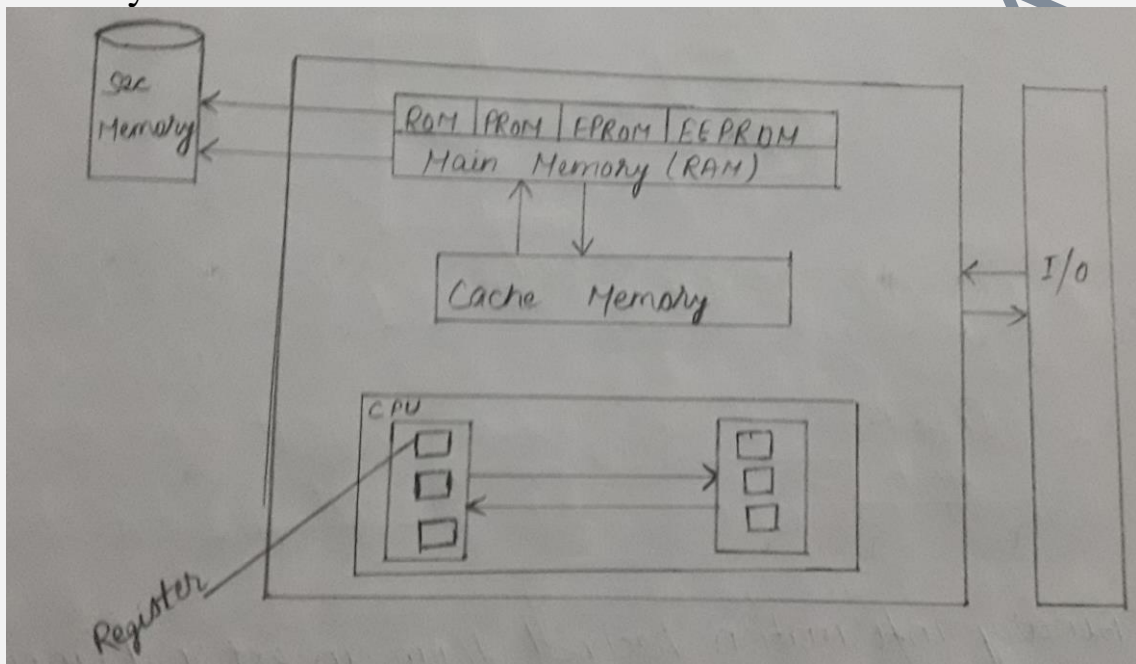
➢ **Register**:-
➢ Register is to handle the process and speed up the rate of information transfer computer uses a number of special memory units called register.
➢ It is a memory unit which hold information as a temporally basis and are the part of c p u (not man memory.
➢ Length of register= number of bit it can stored.
➢ Hence a register than can store 8-bit refers to as an 8-bit register most c p u hold today 64 bit, 32 bit register.
➢ **Input output organization**:-
➢ Binary operation received from an external device is usually store in memory unit called processing.

- ➤ Information transferred from the central computer into external device originates in the memory unit.
- ➤ Data transfer the central computer and I/O device may handle of verity of mode
- ➤ Some modes uses the c p u as an intermediate path, transfer the directly to the and from memory unit.
- ➤ Data transfer to and from peripheral device may be handle of three forms.

(1)Programmed I/O Operation.
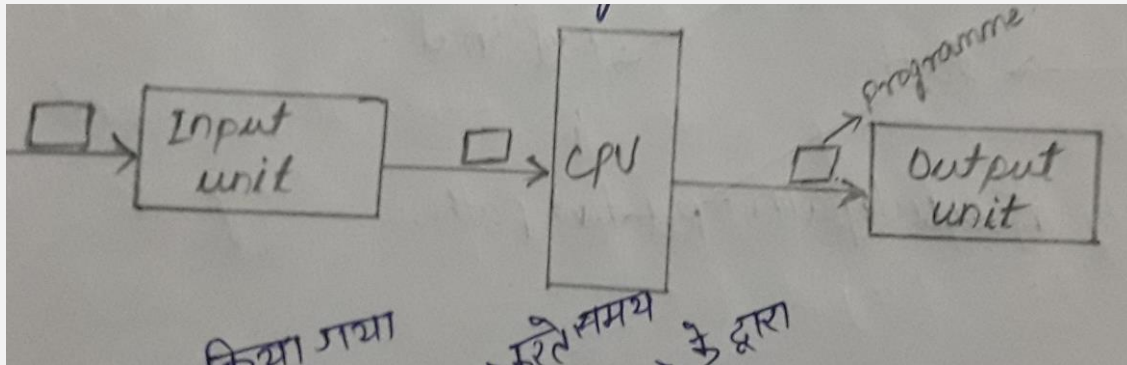
(2)Interrupt driven I/O.

(3)Direct memory Access (DMA).
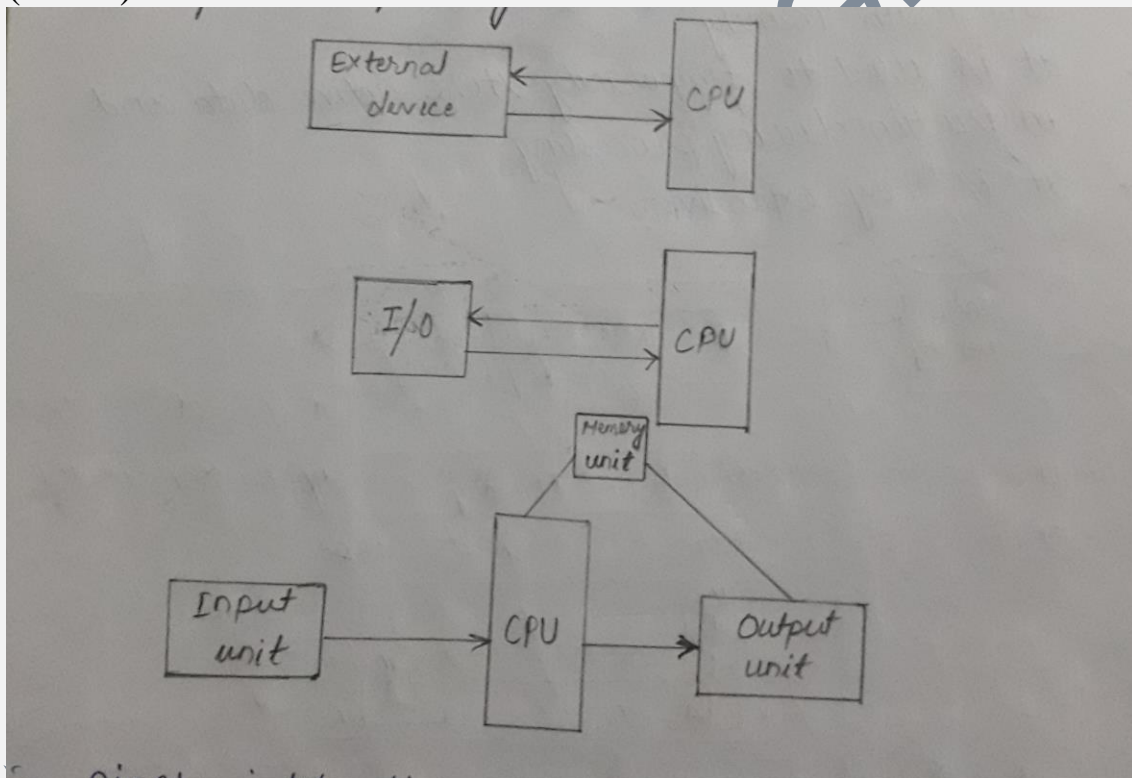
(1)Program input /output operation:-
- ➤ These are the result of input output instruction written in the computer program.

Each latter transfer is inside by an instruction in the program.

(2)Interrupt driven i/o-

➤ In the programmed I/O method the c p u stays in a program loop until the input output unit indicate that it is ready for data transfer that is time consuming process since it keeps the processor busy until it avoided the interrupt facilities. This is called interrupt driven I/O.

(3)DMA:-DMA stands for direct memory access transfer of data under program i/o is between c p u and peripheral an d m a , the interface transfer data into out of the memory until by the path and memory bus directly transfer for the i/o program. This technique is called DMA.

➤ **Memory bus**:-
➤ Contain data and address and read or write (s/w) controlling for access memory.

End -4

UNIT-5
➤ **Over view of a file system** :-
➤ File.
➤ Directories.
➤ Types of file.
➤ Command   -   1. Internal.
                  2. External.
➤ Path: -   1. Absolute.

<div align="center">2. Relative.</div>

- **<u>File: -</u>** A file is smallest unit containing the information on a topic.
- A file is collection of related in information.
- Each file has its name and its attribute.
- A file name is uniquely identifier for the user.
- Data is the contains of a file.
- File is always store in the secondary storage device such as hard disk.
- To get certain ex: - shailesh.txt.
  <div align="center">Shailesh.bmp.</div>
- **<u>Directories: -</u>** Directories is the container of the files. Whenever we saved a typed latter in our pc and given it a nature os (dos) will saved it on our hard disk or secondary storage device in form of electronic fill into electronic folder is called directories.
- O/s works as an electronic drawer for the file.

- **<u>Type of file:-</u>**
- File name extension that is (the three characters appearing after the dots (.)) used in a file name to show the type of file.
- These are described as below:-
  (1)Text files (.txt).
  (2)Backup file (.bak).
  (3)Help file (.hlp).
  (4)Document files (.doc).
  (5)Graphics file (.bmp).
  (6)Ms Access files (.mdb).
  (7)Power points file (.ppt).
  (8)Excel file (.xls).
  (9)C file (.c).
  (10)C++ files (.cpp).

- **<u>Text files (.txt)</u>:-**
- A text files a file which is created show that it can be used by only word processing program or s/w ex- shailesh.txt.

- **<u>Backup file</u>:-**
- Extension name of back file are (.bak).

- This indicates that file contains of contains of the name file and created as a spreadsheet copy for safety purpose in case the original file is deleted or get cropped we can open the back up file.
- **<u>Help file: -</u>** In every software package for example ms-office word star these is a help file which contain information to help the user for hearting specific command. Ex: - doc. help.
- **<u>Document file</u>**:-
- Every word processor created a file which contains some specific symbol along with type text. It contains left spaces, right space, top margin, formatting… etc.

  EX:- Sanjeet.doc

- **<u>Graphical file</u>**:-
- When we draw graphical or picture using special graphics s/w such as M.S paint, card draw etc we use graphics file. Ex: - Sanjeet.bmp.
- There several other types of file for the user for different task such as:-

  M.S-power paint, (.ppt):- for presentation of document.

  M.S excel (.xls):-use as an electronic spared sheet.

  C++ files (.cpp).

  C file (.C).

  Fox pro file (.dbf):-2nd sems...

  Ms Access files (.mdb):-For data base.

- **<u>Ms dos</u>** :-
- It is command line user interface.
- Ms-dos (1.0) was realised in 1981 from I B M computer.
- The latest version of ms-dos is 6.22 came in 1994.
- The history of this operating system is in july 1980 I B M assigned to developed 16bit operating system for pc 1 lakh 86 thousand dollar by micro soft.
- It still can be access from every version of MS-windows by clicking start—Run and typing "Command" or by typing ".cmd" in windows NT, windows-2000, windows-xp

etc..
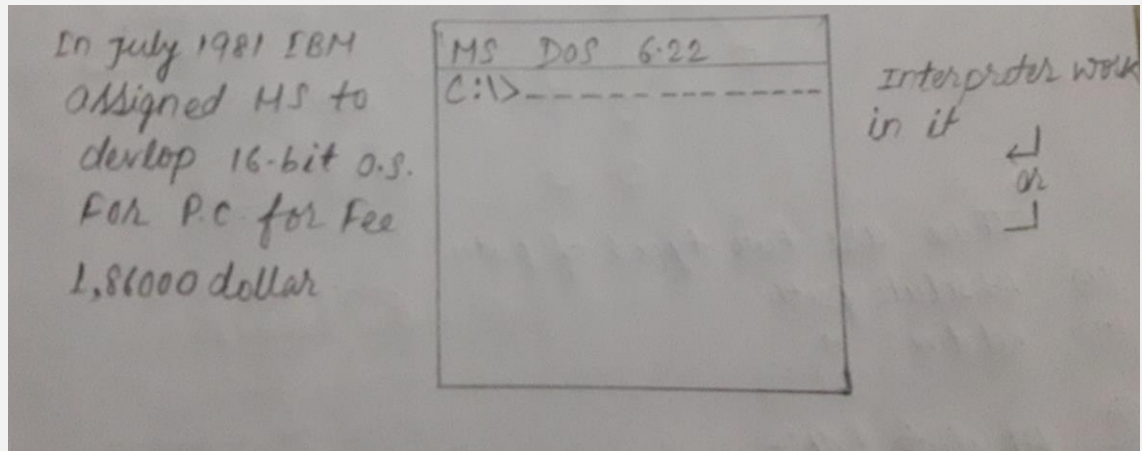
> **Command** :-
> An instruction processed by dos command interpreter.
>   There are two types of commands:-
> Internal command, CD, MD, COPY.
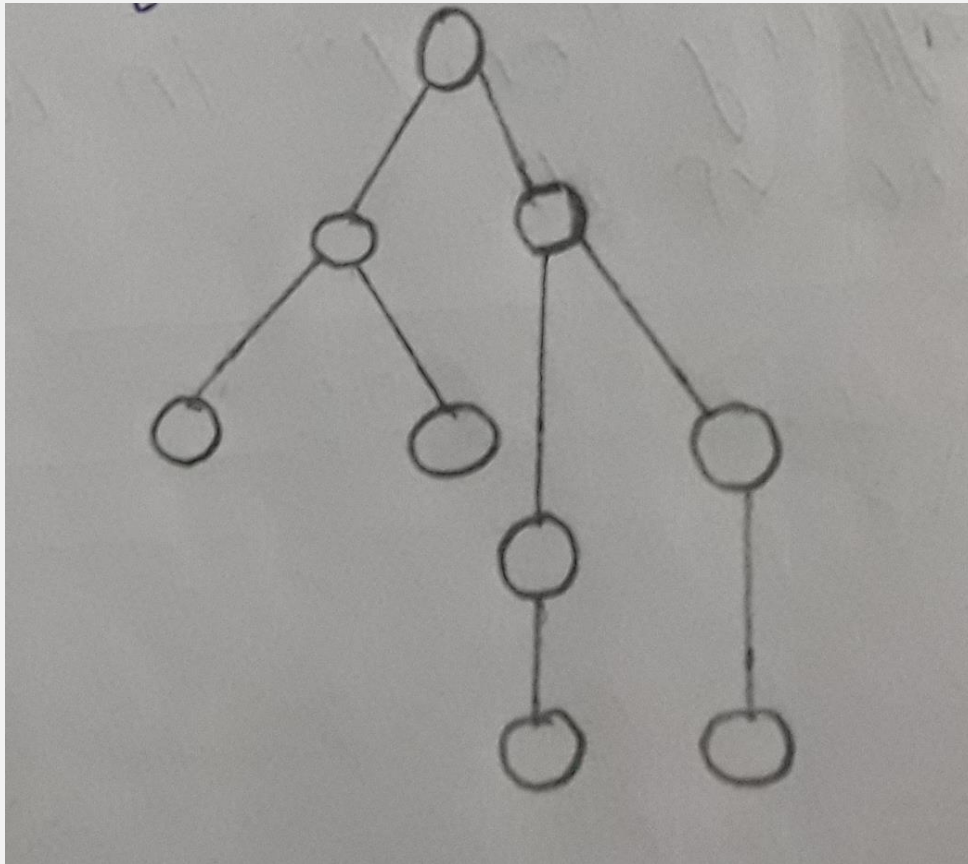> External command
> **Internal command**: - In dos are such programs which get loaded in the memory pc automatically along with dos at a time of booting.
>   Ex:- CD, MD, COPY, etc.
> **External command**: - external command files that do resize on disk. Ex –format.com.
> **Path** :-A list of directories that dos must go through to find a directory or

files.

   (1) Absolute
   (2)Relative.

- **Absolute path**:-A path that start form the driven root directory are called absolute path.
- **Relative path**: - A path that starts from driven current directory is called relative path.
  - **Directory structure:**-
  - Three types of directory structure are:-
  (1)Single level directory.
  (2)Two level directory.
  (3)Hierarchal directory.
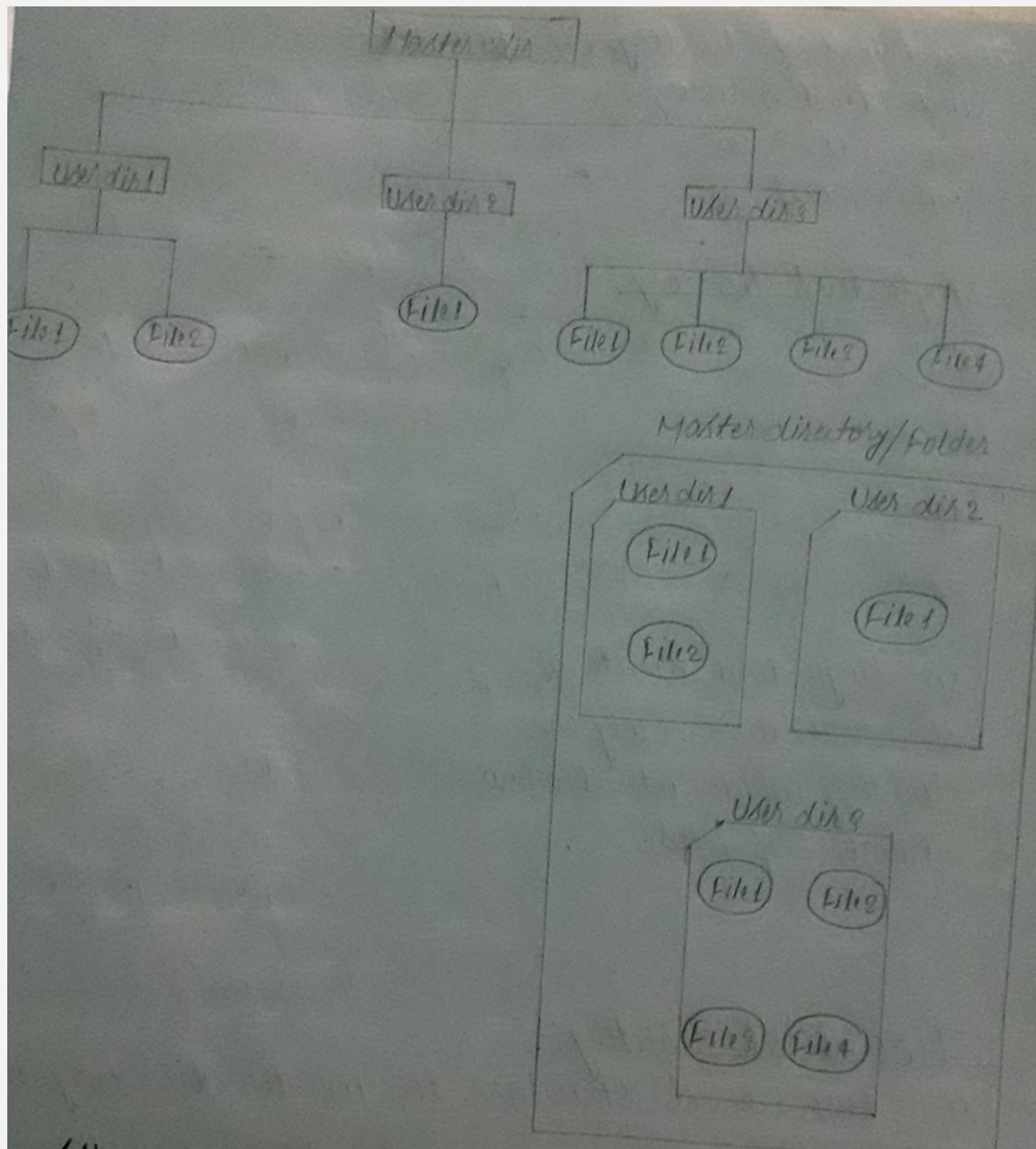 **(1) Single level directory:-**
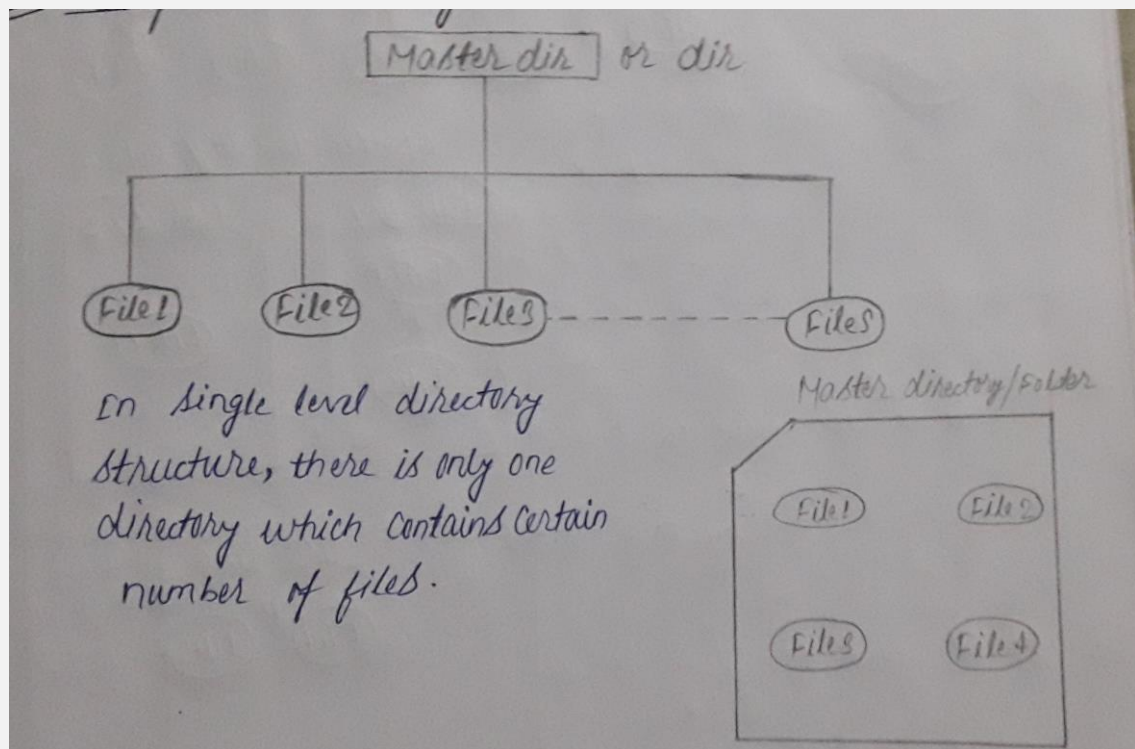
(2) Two level directory:-

➢ In two level structures, the master directory contains number of subdirectories.
➢ In two level directory structures, the root directory contains number of branches with files as

leaves.

(3)Hierarchal directory:-

➢ The hierarchal directory structure works like a tree structure which has root, branches and sub branches with leaves.

➢ In case of hierarchal directory structure, the structure sub directory of master directory also contains the directories.
➢ After two levels directory structure, if any directory level is created then it is said to be hierarchal

structure.
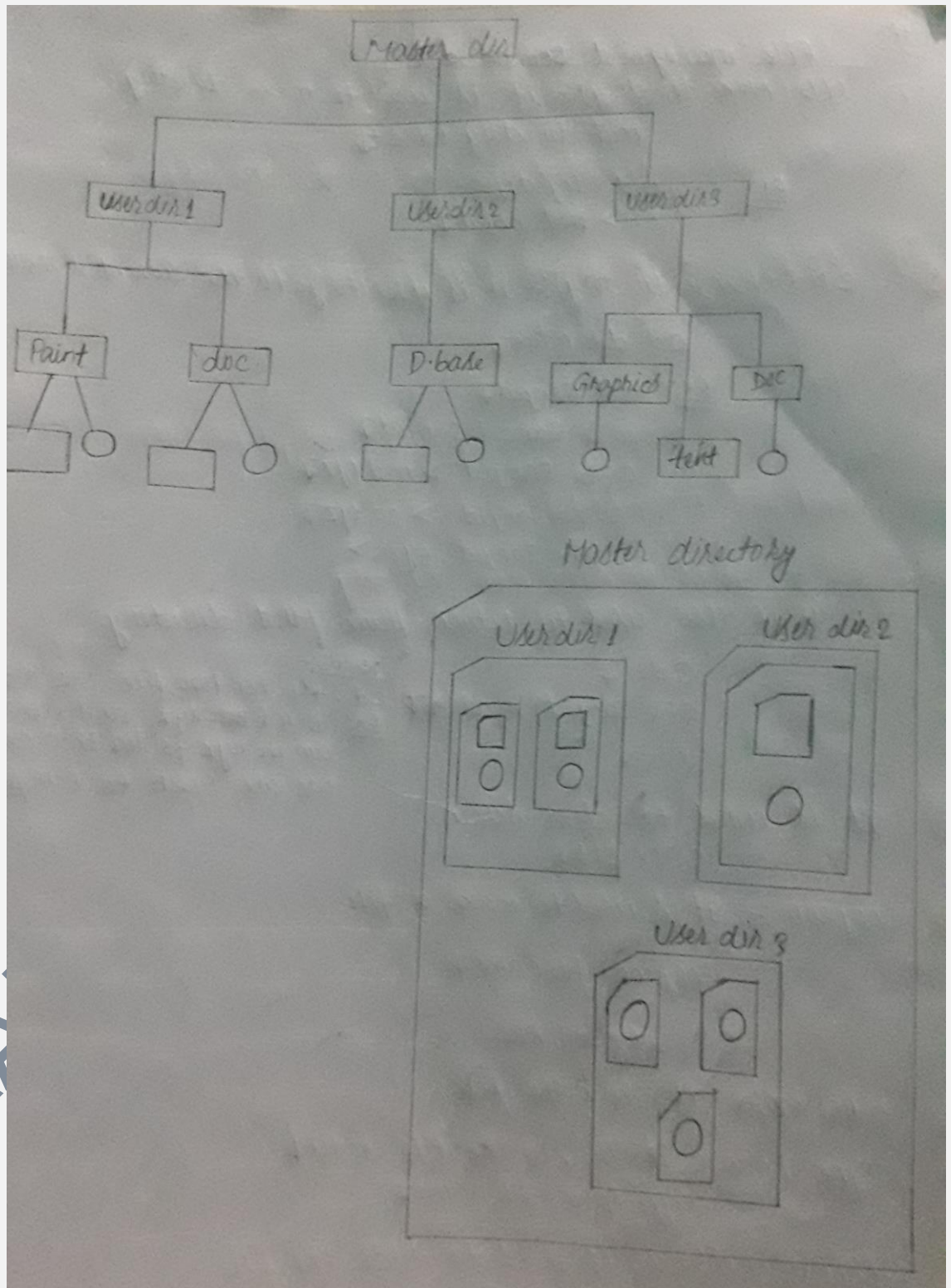
➢ **File management command:-**

- **MD (make directory):-** It is used to make directory m d diramed and press enter key.
- **CD (change directory):-** It is used to go to current directory CD DIR NAME EX: - CD wxyz. Press enter key.
- It is use that to CD-------------or CD1----- it is used to remove a directory.
- C/s- clear the screen.
- **Copy con: -** it is use to make file copy con/ file name.
- **Ctrl+z: -** It is used to save the file.
- **Type command**: - It is use to see the file content.
- **Edit command: -** It is menu driven text editor. It used to make correction in the file name and press enter key.
- **Del command**: - It is used to remove a file. File name and press enter key.
- **Date command**:-It is use to see the date and also change the date. C :\> dates and press enter key. Entered new date {mm: dd: yy}.
- **Time command**:-It is used to see the time c :\> and press enter key. Enter the new time {hh:mm:ss}.
- **Dir. command**:- Display a list of directory file c:\> dir , and press enter key.
- Dir. /p: - display in page format c :\> dir./p:-- press enter key.
- Dir. /b: - brief display c :\> dir. /b press enter key.
- Dir. /ah: =header file display c :\> dirah press enter key.
- Dir. /ar: = read only file display c:\>dirar press enter key.
- dir. /l:-Display in lowest.
- **Tree command**:-It is use to see the directory in hierarchal structure. C:\>tree.
- **Driven command**:-It is use to change the driven. d:/> press enter key
- **Format command**:-It is use to mark the screen format driven name and press enter key prepare a blank disk for receive and storing.
- **Fc /?** - It is used to display about command.

- **Move command**:-To move a file v :\> move source file name. d:\ deep press enter key.
- **Exit command: -** It is use to leave from the dos c :\> exit and press enter key.
- **RD**:-It is used to move directory**.**
- **CD..:-**When two file create for BCA and XYZ and now I am in XYZ folder then press cd... Then enter key. We are reaching to BCA folder.

<u>End</u>