

COMPUTER FUNDAMENTAL

❖ FULL FORM OF COMPUTER

- ✓ C= COMMON
- ✓ O=OPERATING
- ✓ M=MACHINE
- ✓ P=PROPERLY OR PURPOSE
- ✓ U=USED FOR
- ✓ T=TRAINING
- ✓ E=EDUCATION
- ✓ R=RESEARCH

❖ COMPUTER:

It is high speed electronic system which input data, processing data and retrieve data through the output.

Data : - Data is raw facts which may or may not be useful to us
For ex-AARUSH,2015 etc

INFORMATION. :- It is set of instruction which is useful to us.



❖ ADVANTAGE OF COMPUTER:

SPEED:- Computer are much faster as compared to human beings. A modern computer can execute millions of instruction in One Second.

ACCURACY:- Computer can perform all calculation and comparisons accurately

MEMORY CAPACITY:- Computer can store large amount of information in a very small space.

Versatility: - Computer can perform repetitive jobs efficiently.

❖ DISADVANTAGE:

LACK OF INTELEAGENT:- Computers cannot decide on their own. They lack the power which is a great asset to us and everybody who is a human

Language:- Need to learn proper language

No IQ:- Computers are dumb machines with zero IQ. They need to be told

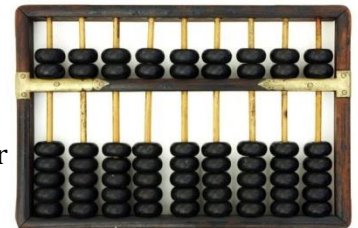
EVOLUTION OF COMPUTER:-

ABACUS:- Abacus was the first counting device. People used to count and calculate with Abacus

Napier Bones:- John Napier In 1617 an eccentric (some say mad) Scotsman named John Napier invented logarithms, which are a technology that allows multiplication to be performed via addition.

Ex: $\log_2 x = 5$

Pascaline Calculator:- In 1642 Blaise Pascal, invented the Pascaline Calculator



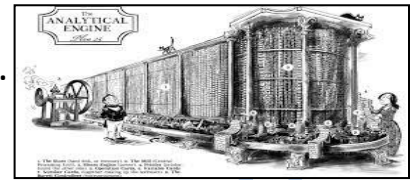
Leibniz Calculator:- In 1671 the German Gottfried Wilhelm Leibniz (co-inventor with Newton of calculus) managed to build a four-function (addition, subtraction, multiplication, and division) calculator that he called the stepped reckoner

Difference Engine:- 1822 the English mathematician Charles Babbage was proposing a steam driven calculating machine the size of a room, which he called the Difference Engine.

ANALYTICAL ENGINE:- 1833 Charles Babbage was proposing Analytical Engine

Hollerith Desk:- Hollerith's technique was successful and

The 1890 census was completed in only 3 years at a savings of 5 million dollars.



GENERATION OF COMPUTER

FIRST GENERATION (1946-1954) This Gen of Computer was marked by VACUUM TUBE

Ex: EDVAC, ENIAC, UNIVAC

ADVANTAGE:-

- ☞ Electronic digital computer
- ☞ Only vacuum tubes are required

DISADVANTAGE

- ☞ LARGE SIZE
- ☞ HEAT GENERATING
- ☞ AIRCONDITION REQUIRED



2ND GENERATION (1954-1965) This Gen of Computer was marked by TRANSISTOR

EX: - IBM 1400, IBM 7000

ADVANTAGE:-

- ☞ SMALLER IN SIZE
- ☞ LOW ELECTRICITY
- ☞ INPUT/OUTPUT WAS FASTER

DISADVANTAGE

- ☞ LARGE SIZE
- ☞ HEAT GENERATING
- ☞ AIRCONDITION REQUIRED



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3RD GENERATION (1966-1971) This Gen of Computer was marked by INTEGRATED CIRCUIT

EX: - CDC 6600, CDC 7600, IBM 360

ADVANTAGE

- ☞ LOW COST
- ☞ GREATER SPEED
- ☞ SMALL SIZE EASILY PORTABLE

DISADVANTAGE

- ☞ MANUFACTURING DIFFICULTY
- ☞ AIRCONDITION REQUIRED



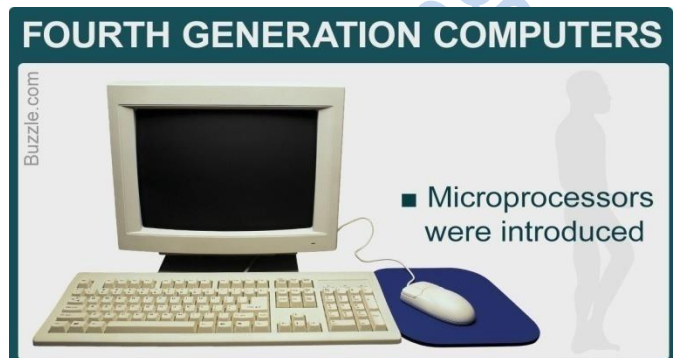
4TH GENERATION (1971-1989) This Gen of Computer was marked by LSIC & VLSIC

ADVANTAGE

- ☞ LOW COST
- ☞ GREATER SPEED
- ☞ SMALL SIZE EASILY PORTABLE
- ☞ NO AIRCONDITION

DISADVANTAGE

- ☞ MANUFACTURING DIFFICULTY
- ☞ COMPLEX SOFTWARE



5TH GENERATION (1990- TILL DATE) this gen of computer was marked by VVLSIC.

ADVANTAGE

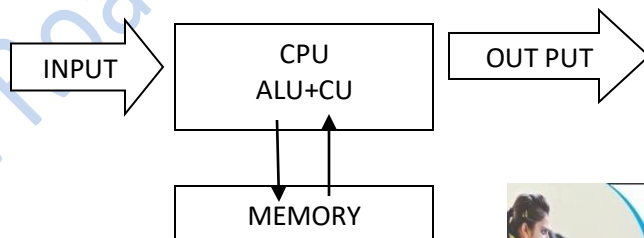
- ☞ INTELLIGENT PROGRAMMING
- ☞ KNOWLEDGE BASED INFORMATION SYSTEM
- ☞ HIGH PERFORMANCE
- ☞ IMPROVED HUMAN MACHINE INTERFACE

DISADVANTAGE

- ☞ MANUFACTURING DIFFICULTY
- ☞ COMPLEX SOFTWARE
- ☞ PROGRAMER WILL HAVE TO LEARN PROGRAMMING LANGUAGE



BLOCK DIOGRAME OF COMPUTER



CPU – Central Processing Unit
ALU – Arithmatic Logic Unit
CU – Control Unit



MEMORY UNIT

Memory unit usually store program and also used for calculation and result.

Unit of Memory:-

4 Bit= 1 Nibble

8Bit=1Byte

1024 Byte = 2^{10} byte = 1 kb (Killo Byte)

1024 KB= 2^{10} kb= 1 MB (Mega Byte)

1024 MB = 2^{10} MB= 1 GB (Giga Byte)

1024 GB= 2^{10} GB=1 TB(Tera Byte)

NUMBER SYSTEM

1. Positional Number
2. Non Positional Number

System	Base	Symbols
Decimal	10	0, 1, ... 9
Binary	2	0, 1
Octal	8	0, 1, ... 7
Hexa- decimal	16	0, 1, ... 9, A, B, ... F

Decimal to Binary

2		125	
2		62	1
2		31	0
2		15	1
2		7	1
2		3	1
2		1	1
2		0	1

$125_{10} = 1111101_2$

Binary to Decimal

$101011_2 \Rightarrow$

$1 \times 2^0 =$	1
$1 \times 2^1 =$	2
$0 \times 2^2 =$	0
$1 \times 2^3 =$	8
$0 \times 2^4 =$	0
$1 \times 2^5 =$	32
	43₁₀

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Binary to decimal

$$10.1011 \Rightarrow \begin{array}{r} 1 \times 2^{-4} = 0.0625 \\ 1 \times 2^{-3} = 0.125 \\ 0 \times 2^{-2} = 0.0 \\ 1 \times 2^{-1} = 0.5 \\ 0 \times 2^0 = 0.0 \\ 1 \times 2^1 = 2.0 \\ \hline 2.6875 \end{array}$$

Decimal to binary

$$3.14579 \rightarrow 11.001001\dots$$

.	14579
x	2
<hr/>	
0	.29158
x	2
<hr/>	
0	.58316
x	2
<hr/>	
1	.16632
x	2
<hr/>	
0	.33264
x	2
<hr/>	
0	.66528
x	2
<hr/>	
1	.33056
etc.	

Octal To Decimal

$$724_8 \Rightarrow \begin{array}{r} 4 \times 8^0 = 4 \\ 2 \times 8^1 = 16 \\ 7 \times 8^2 = 448 \\ \hline 468_{10} \end{array}$$

Decimal To Octal

8		1234	
8		154	2
8		19	2
8		2	3
		0	2

$1234_{10} = 2322_8$

Decimal To Hexadecimal

$$1234_{10} = ?_{16}$$

16		1234	
16		77	2
16		4	13 = D
		0	4

$1234_{10} = 4D2_{16}$

Hexadecimal to Octal

	1	F	0	C
↓	↓	↓	↓	↓
0001	1111	0000	1100	
1	7	4	1	4

$1F0C_{16} = 17414_8$



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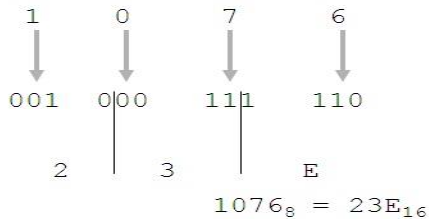
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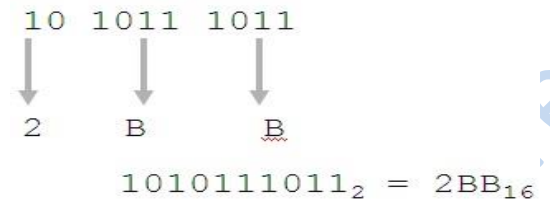
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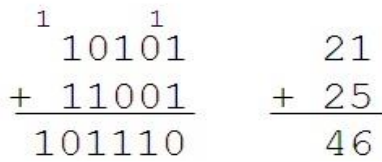
Oct To Hexa



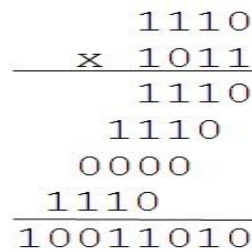
Bin To Hexa



Binary Addition

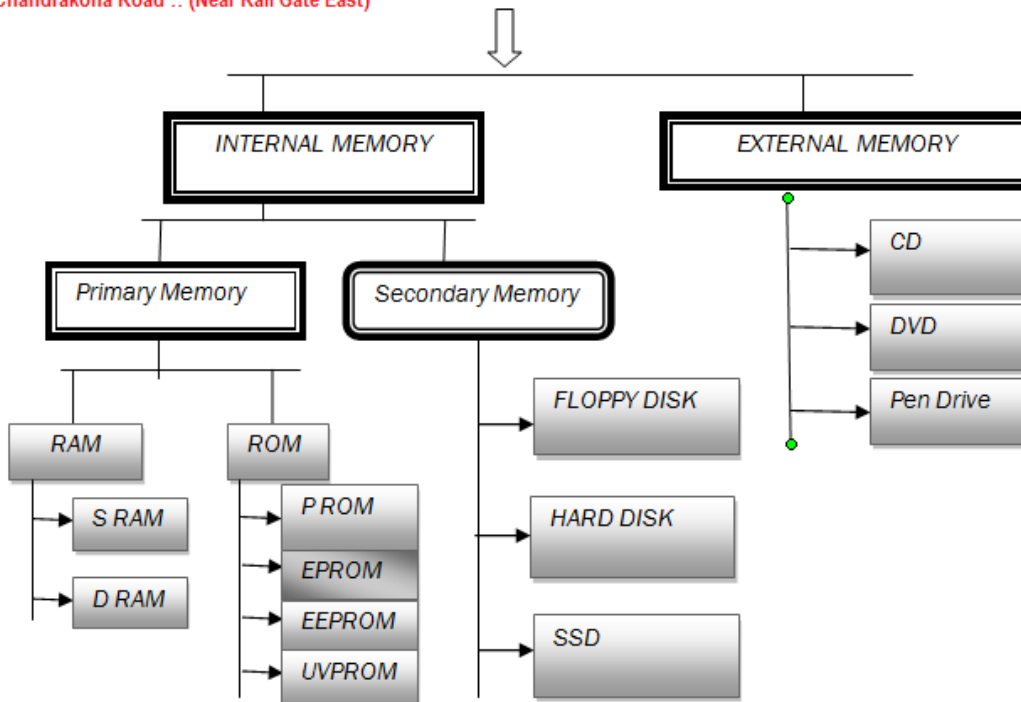


Binary multiplication



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Memory



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1) Static RAM (SRAM)

The word **static** indicates that the memory retains its contents as long as power is being supplied. However, data is lost when the power gets down due to volatile nature.

Characteristic of the Static RAM

- It has long life
- There is no need to refresh
- Faster
- Used as cache memory
- Large size
- Expensive
- High power consumption

2) Dynamic RAM (DRAM)

DRAM, unlike SRAM, must be continually **refreshed** in order to maintain the data. This is done by placing the memory on a refresh circuit that rewrites the data several hundred times per second.

Characteristics of the Dynamic RAM

- It has short data lifetime
- Need to be refreshed continuously
- Slower as compared to SRAM
- Used as RAM
- Lesser in size
- Less expensive
- Less power consumption

Read Only Memory (ROM)

ROM stands for Read Only Memory. The memory from which we can only read but cannot write on it. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture.

Advantages of ROM

The advantages of ROM are as follows:

- Non-volatile in nature
- These cannot be accidentally changed
- Cheaper than RAMs
- Easy to test
- More reliable than RAMs
- These are static and do not require refreshing
- Its contents are always known and can be verified



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FULL FORM

RAM – RANDOM ACCESS MEMORY, (It is also called volatile memory)

SRAM - STATIC RANDOM ACCESS MEMORY

DRAM - DYNAMIC RANDOM ACCESS MEMORY

ROM - READ ONLY MEMORY, (It is also called nonvolatile memory)

PROM - PROGRAMMABLE READ ONLY MEMORY

EPROM - ERASABLE PROGRAMMABLE READ ONLY MEMORY

EEPROM - ELECTRICAL ERASABLE PROGRAMMABLE READ ONLY MEMORY

UVROM - ULTRA VIOLET ERASABLE PROGRAMMABLE READ ONLY MEMORY

ASCII - AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE

EBCDIC - EXTENDED BINARY CODED DECIMAL INTERCHANGE CODE.

BIT - BINARY DIGIT

CD - COMPACT DISK

ALU - ARITHMETIC LOGIC UNIT

CU - CONTROL UNIT

CPU - CENTRAL PROCESSING UNIT

DOS - DISK OPERATING SYSTEM

BIOS - BASIC INPUT OUTPUT SYSTEM

POST - POWER ON SELF TEST

FAT - FILE ALLOCATION TABLE

VDU - VISUAL DISPLAY UNIT

UPS - UNINTERRUPTABLE POWER SUPPLY

SMPS - SWITCH MODE POWER SUPPLY

DVD - DIGITAL VERSATILE DISK.

Floppy: - Is an input as well as output device. It is made of plastic material. The plastic base is coated with an iron oxide .3.5 inch floppy disk storage capacity of 1.44 MB

Hard disk:- a rigid non-removable magnetic disk with a large data storage capacity.

PARTS OF COMPUTER

☞ HARDWARE

☞ SOFTWARE

☞ FIRMWARE

OUTPUT DEVICE OF COMPUTER



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HARDWARE: All electronics parts of computer which seen in touch called hardware.

Example: - keyboard, mouse, cabinet, CPU etc.

Type of hardware:

Three Type Of Hardware

- ☞ Input device
- ☞ Output device
- ☞ Processing system

Input device:-

Using this device we give data to the computer called input device.

Exam: keyboard, mouse, reader, web cam.

KEYBOARD

Keyboard is a device which resembles a typewriter. A keyboard has about 105 keys.

The keys on the keyboard can be classified in the following categories:

- a) Numeric keys.
- b) Alphabetical keys.
- c) Special keys
- d) Arrow keys.
- e) Function Keys.



a) Numeric Keys :- These keys are used for entering numbers. There are ten numbers which are printed in the keyboard. They are 0, 1, 2,3,4,5,6,7,8 and 9.

b) Alphabetical keys:- Under the numeric keys there are rows on which letters **(A-Z)** are printed. There are 26 alphabetical keys From **A** to **Z** present on the keyboard

c) Special keys:- They are also special keys present on the keyboard. They are- TABKEY, CAPS LOCK KEY,CONTROL KEY

BACK SPACE KEY, DELETE KEY, HOME, END, PAGE UP, PAGE DOWN.

d) Arrow keys:- There are four cursor-moving keys on the extreme right side of the keyboard.

e) Function Keys:- These keys are marked from **F1** to **F12** and are situated at the top most row of the keyboard.

They are- F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, and F12

MOUSE

MOUSE:- "Manually Operated Utility for Selecting Equipment"

Mouse is the useful hand-operated input device. It is usually placed on the mouse-pad to scroll.

When a user scrolls the mouse, the pointer moves in the direction of mouse.

Advantages

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of keyboard.



A mouse has three buttons i) Left mouse button. ii) Right mouse button. iii) Scroll or middle button

Some Important term in mouse.-

- 1) Click-press left mouse button once at a time and release it.
- 2) Right Click. - press Right mouse button once at a time and release it.
- 3) Scroll – Press left mouse button, drag over some area and release it.
- 4) Double click – press left mouse button twice at a time and release it.

Scanner: Scanners are used to enter information directly in to the computer memory. This device works like a Xerox machine. The scanner converts any type of printed or written information including photographs into digital pulses, which can be manipulated by the computer.



Track Ball: Track ball is similar to the upside- down design of the mouse. The user moves the ball directly, while the device itself remains stationary. The user spins the ball in various directions to effect the screen movements.



Light Pen: This is an input device which is used to draw lines or figures on a computer screen. It is touched to the CRT screen where it can detect raster on the screen as it passes.



Optical Character Reader (OCR): It is a device which detects alpha numeric characters printed or written on a paper. The text which is to be scanned is illuminated by a low frequency light source. The light is absorbed by the dark areas but reflected from the bright areas. The reflected light is received by the photocells.



Bar Code Reader: This device reads bar codes and converts them into electric pulses to be processed by a computer. A bar code is nothing but data coded in form of light and dark bars.



Voice Input Systems: It converts spoken words to machine language form. A microphone is used to convert human speech into electric signals. The signal pattern is then transmitted to a computer when it is compared to a dictionary of patterns that have been previously placed in a storage unit of computer. When a close match is found, the word is recognized.



Digital Camera: It converts graphics directly into digital form. An electronic chip is used in camera, when light falls, on the chip through the lens, it converts light waves into electrical waves.



Output device: -

Using this device we get data to the computer called input device.

Exam- VDU (visual display unit), printer, music box.

1)Cathode-Ray Tube (CRT) Monitor

The CRT display is made up of small picture elements called pixels. The smaller the pixels, the better the image clarity, or resolution

- Large in Size
- High power consumption



2)Flat-Panel Display Monitor

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement in comparison to the CRT. You can hang them on walls or wear them on your wrists. Current uses of flat-panel displays include calculators, video games, monitors, laptop computer, graphics display. The flat-panel display is divided into two categories:

- Emissive Displays** - The emissive displays are devices that convert electrical energy into light. Example are plasma panel and LED(Light-Emitting Diodes).
- Non-Emissive Displays** - The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. Example is LCD(Liquid-Crystal Device)

1.4.4Printers

Printer is an output device, which is used to print information on paper.

There are two types of printers:

- Impact Printers
- Non-Impact Printers

A)Impact Printers

The impact printers print the characters by striking them on the ribbon which is then pressed on the paper.

Characteristics of Impact Printers are the following:

- Very low consumable costs
- Very noisy
- Useful for bulk printing due to low cost
- There is physical contact with the paper to produce an image

These printers are of two types

- Character printers
- Line printers

Character Printers

Character printers are the printers which print one character at a time.

These are further divided into two types:

- Dot Matrix Printer(DMP)



- Daisy Wheel

1) Dot Matrix Printer

In the market one of the most popular printers is Dot Matrix Printer. These printers are popular because of their ease of printing and economical price. Each character printed is in form of pattern of dots and head consists of a Matrix of Pins of size (5*7, 7*9, 9*7 or 9*9) which come out to form a character that is why it is called Dot Matrix Printer.

Advantages

- Inexpensive
- Widely Used
- Other language characters can be printed

Disadvantages

- Slow Speed
- Poor Quality

2) Daisy Wheel

Head is lying on a wheel and pins corresponding to characters are like petals of Daisy (flower name) that is why it is called Daisy Wheel Printer. These printers are generally used for word-processing in offices which require a few letters to be sent here and there with very nice quality.

Advantages

- 1) More reliable than DMP
- 2) Better quality
- 3) The fonts of character can be easily changed

Disadvantages

- 1) Slower than DMP
- 2) Noisy
- 3) More expensive than DMP

B) Non-impact Printers

Non-impact printers print the characters without using ribbon. These printers print a complete page at a time so they are also called as Page Printers.

These printers are of two types

1. Laser Printers
2. Inkjet Printers

Characteristics of Non-impact Printers

1. Faster than impact printers.
2. They are not noisy.
3. High quality.
4. Support many fonts and different character size.

Laser Printers

These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.

Advantages

1. Very high speed
2. Very high quality output
3. Give good graphics quality
4. Support many fonts and different character size

Disadvantages

1. Expensive.



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2. Cannot be used to produce multiple copies of a document in a single printing.

Inkjet Printers

Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

They make less noise because no hammering is done and these have many styles of printing modes available. Color printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages

- High quality printing
- More reliable

Disadvantages

- Expensive as cost per page is high
- Slow as compared to laser printer



PROCESSING DEVICE

Using the device process data to the computer

Example:- CPU

Central Processing Unit Front Panel and Back Panel



CPU Front Panel



CPU Back Panel

SOFTWARE

It is set of sequential programs which perform any specific work called Software.

Example:- Photo shop. MS-Office, MP₃-Player

Program:- A set of instruction.

Type of software.

- ☞ APPLICATION software.
- ☞ SYSTEM software.

APPLICATION SOFTWARE

- ☞ This software developed for specific application called application software.
- ☞ **Example:-** MS-Office(word, excel ,PowerPoint, Access);Tally ,Mozilla Firefox

SYSTEM SOFTWARE

- ☞ Software which operates the system and control called System software.
- ☞ **Example:-** WINDOWS XP, WINDOWS -7, LINUX

Firmware:

It is the set of instruction for inter-relation communication and combination of Hardware & Software.

Types of Computer

i) Analog Computer II) Digital Computer III) Hybrid Computer

1) ANALOG COMPUTER:

This computer developed on the principal of measurement called Analog computer.
EX :- Thermometer , speedometer , weight machine

2) Digital Computer:

This computer developed on the principal of counting called digital computer

It has four types:- i) Micro computer
ii) Mini Computer
iii) Main frame Computer
iv) Super Computer

3) HYBRID COMPUTER

This computer developed by combination both of analog & digital computer called hybrid computer.

Example: **Robot**



SHORTCUT KEY

Ctrl + A – Select All

Ctrl +B – Bold

Ctrl +C – Copy

Ctrl+D =Fill Down

Ctrl+E=Centre Alignment

Ctrl+F=Find

Ctrl+G=Goto

Ctrl+H=Replace

Ctrl+I=Italic

Ctrl+J=Justify

Ctrl+K=Hyperlink

Ctrl+L=Left Alignment

Ctrl+M=Increase Indent

Ctrl+N=New Doc.

Ctrl+O=Open

Ctrl+P=Print

Ctrl+Q=Align text Left

Ctrl+R=Fill Right

Ctrl+S=Save

Ctrl+T=Transpose Line

Ctrl+U=Underline

Ctrl+V=Paste

Ctrl+W=Close

Ctrl+X=Cut

Ctrl+Y=Redo

Ctrl+Z=Undo

F1=Help; F2=Edit

F3=Paste Name

F4=Repeat Last Action

F5=Goto

F7=Spell Check F8=Extend mode

F9=Recalculate all workbook

F10= Activate menu bar

F11=New Chart F12=Save as

VIRUS (Vital Information Resources Under Seize.)

A computer virus is a malicious software program loaded onto a user's computer without the user's knowledge and performs malicious actions.

These viruses spread when someone copies infected program from one computer and runs it on some other computer.

Example- Acid Rain, Umbrella, Danish boot, Happy Birth day, Love, Sunday

Symptoms of a computer virus:-

- ☞ The computer starts working slower.
- ☞ All the file and data deleted.
- ☞ The size of some files changes.

Types of computer virus

1. Resident Viruses

- ☞ This type of virus is a permanent which dwells in the RAM memory.

2. Multipartite Viruses

- ☞ Multipartite viruses are distributed through infected media and usually hide in the memory.

3. Direct Action Viruses

- ☞ The main purpose of this virus is to replicate and take action when it is executed. When aspecific condition is met, the virus will go into action and infect files in the directory or folderthat it

4. Overwrite Viruses

- ☞ Virus of this kind is characterized by the fact that it deletes the information contained in the files that it infects, rendering them partially or totally useless once they have been infected.



5. Boot Virus

This type of virus affects the boot sector of a floppy or hard disk. This is a crucial part of a disk, in which information on the disk itself is stored together with a program that makes it possible to boot (start) the computer from the disk.

6. Macro Virus

Macro viruses infect files that are created using certain applications or programs that contain macros.

7. Network Virus

Network viruses rapidly spread through a Local Network Area (LAN), and sometimes throughout the internet. Generally, network viruses multiply through shared resources, i.e., shared drives and folders. When the virus infects a computer, it searches through the network to attack its new potential prey. When the virus finishes infecting that computer, it moves on to the next and the cycle repeats itself.

8. FAT Virus

The file allocation table or FAT is the part of a disk used to connect information and is a vital part of the normal functioning of the computer.

This type of virus attack can be especially dangerous, by preventing access to certain sections

of the disk where important files are stored. Damage caused can result in information losses from individual files or even entire directories.

9. Worms

A worm is technically not a virus, but a program very similar to a virus; it has the ability to self-replicate, and can lead to negative effects on your system and most importantly they are

detected and eliminated by antiviruses.

10. Trojans or Trojan Horses

Another unsavory breed of malicious code (not a virus as well) are Trojans or Trojan horses,

which unlike viruses do not reproduce by infecting other files, nor do they self-replicate like worms.

11. Logic Bombs

They are not considered viruses because they do not replicate.



Use of Antivirus software

Antivirus or **anti-virus** software (often abbreviated as **AV**), sometimes known as **antimalware**

software, is computer software used to prevent, detect and remove malicious software.

Antivirus (or anti-virus) software is used to safeguard a computer from malware, including viruses, computer worms, and Trojan horses

Antivirus software may also remove or prevent spyware and adware, along with other forms

of malicious programs. Free antivirus software generally only searches your computer using signature-based detection which involves looking for patterns of data that are known to be related to already-identified malware. Paid antivirus software will usually also include heuristics to catch new, or zero-day threats, by either using genetic signatures to identify new variants of existing virus code or by running the file in a virtual environment (also called a sandbox), and watching what it does to see if it has malicious intent.

Virus designers, however, usually test their malicious code against the major antivirus types of malware, specifically ransom ware, use polymorphic code to make it difficult to be detected by antivirus software. Besides using antivirus software to keep your computer safe and running smoothly, it is also always a good idea to be proactive: make sure your web browser is updated to the latest version, use a firewall, only download programs from websites you trust and always surf the web using a standard user account, rather than your administrator one.

Some Common Antivirus:- 1) Norton 2) Quick Heal 3) Kaspersky.4) AVG

1. What is a computer?

A computer is an electronic device, which can perform a variety of operation according to a set of instructions called program.

2. What is computer Program?

A computer program is a set of instructions given to computer to perform some operation

3. What are data ? What is the output of data processing system

Data are raw fact and figures. Data processing system transforms data into useful information

4. What are the major strengths and weakness of computer?

Strengths:

1. Speed
2. Accuracy
3. Reliability
4. Versatility
5. High storage Capacity

Weaknesses:

1. Lack of decision making power.
2. Zero IQ

5. What are the four fundamental components of a computer system ?

- i) Input Unit
- ii) CPU(central Processing Unit
- iii) Internal Memory
- iv) Output Unit

