Basics of computers and computer Applications for SSC & Railway Exams

BASICS OF COMPUTERS AND COMPUTER APPLICATIONS

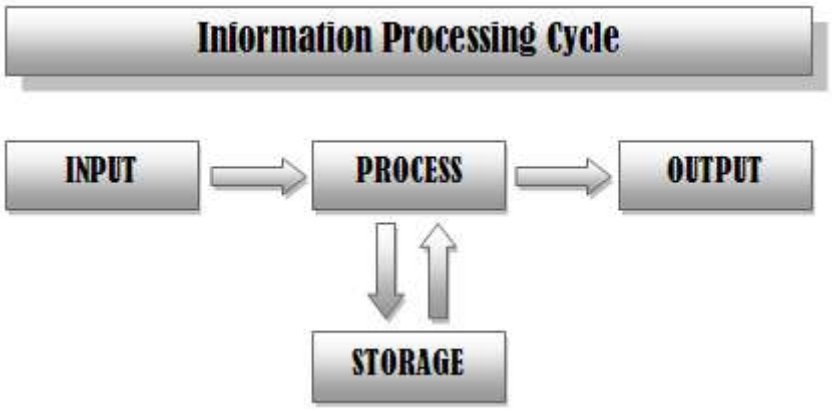
Basics of computers and computer Applications for SSC & Railway Exams

Introduction of Computer

- A computer is a machine or device that performs processes, calculations and operations based on Instructions provided by a software or hardware program. It is designed to execute applications and provides a variety of solutions by combining integrated hardware and software components.
- A computer system consists of hardware and software components
- Hardware is the physical equipment such as the case, storage devices, key boards ,moniters,cables,speakers and printers
- Software is the operating systems and programs.
  1. The operating system instructs the computer how to operate
  2. Programs or applications perform different functions
- **COMPUTER** stands for **C**ommon **O**perating **M**achine **P**urposely **U**sed for **T**echnological and **E**ducational **R**esearch.

Information processing cycle

- It is a process of events in processing information which includes input, processing, storage and output. These processes work together & repeat over & over
  1. Input –Entering data into the computer
  2. Output-Performing the operation on the computer
  3. Output-Presenting the result
  4. Storage-Saving data program or output for future use



Basics of computers and computer Applications for SSC & Railway Exams

- A Computer is an electronic device that takes raw data (unprocessed) as an input from the user and processes it under the control of a set of instructions (called program), produces a result (output), and saves it for future use.

Generation of Computer

- Growth in the computer industry is determined by the development in technology.
- Based on various stages of development, computers can be categorized into different generations.

First Generation (1942-1955):

Hardware:

The hardware used in the first generation of computers were:

- **Vacuum Tubes**
- **Punch Cards**.

Features:

Following are the features of first generation computers −

- It supported **machine language only**.
- It had slow performance
- It occupied large size due to the use of vacuum tubes.
- It had a poor storage capacity.
- It consumed a lot of electricity and generated a lot of heat.
- Malfunction due to overheat
- Non-portable

Memory:

The memory was of **4000 bits**.

Data Input

The input was only provided through hard-wired programs in the computer, mostly through punched cards and paper tapes.

Examples

The examples of first generation computers are −

- ENIAC (Electronic Numeric Integrated And Calculator)
- EDVAC
- UNIVAC

- IBM-701
- IBM-650

Second Generation (1955-1964):

Several advancements in the first-gen computers led to the development of second generation computers. Following are various changes in features and components of second generation computers −

Hardware:

The hardware used in the second generation of computers were:

- **Transistors**
- **Magnetic Tapes**

Features

It had features like −

- First operating system was developed - Batch Processing and Multiprogramming Operating System
- Faster and smaller in size as compared to first-generation computers
- Reliable and energy efficient than the previous generation
- Machine language as well as Assembly language was used.

Memory

The capacity of the memory was **32,000 bits**.

Data Input

The input was provided through **punched cards**.

Examples

The examples of second generation computers are −

- Honeywell 400
- CDC 1604
- CDC 3600
- IBM 7030
- IBM 1401
- IBM 1620

Third Generation (1964-1975):

Following are the various components and features of the third generation computers −

Hardware:

The hardware used in the third generation of computers were

- **Integrated Circuits made from semi-conductor materials**
- **Large capacity disks and magnetic tapes**

Features

The features of the third generation computers are −

- Supports **time-sharing OS**
- Faster, smaller, more reliable and cheaper than the previous generations
- Easy to access
- High Level Languages were used

Memory

The capacity of the memory was **128,000 bits**.

Data Input

The input was provided through keyboards and monitors.

Examples

The examples of third generation computers are −

- IBM 360/370
- CDC 6600
- PDP 8/11

Fourth Generation (1975-1980):

Fourth generation computers have the following components and features −

Hardware

The Hardware used in the fourth generation of computers were −

- **ICs with Very Large Scale Integration (VLSI) technology**
- **Semiconductor memory**
- **Magnetic tapes and Floppy**

Features

It supports features like −

- Multiprocessing & distributed OS
- Object-oriented high level programs supported
- Small & easy to use; hand-held computers have evolved
- No external cooling required & affordable

- This generation saw the development of networks and the internet
- It saw the development of new trends in GUIs and mouse

Memory

The capacity of the memory was **100 million bits**.

Data Input

The input was provided through improved hand held devices, keyboard and mouse.

Examples

The examples of fourth generation computers are −

- Apple II
- VAX 9000
- CRAY 1 (super computers)
- CRAY-X-MP(Super Computer)

Fifth Generation (1980-Present):

These are the modern and advanced computers. Significant changes in the components and operations have made fifth generation computers handy and more reliable than the previous generations.

Hardware

The Hardware used in the fifth generation of computers are −

- **Integrated Circuits with ULSI and Nano technology**
- **Large capacity hard disk with RAID support**
- **Powerful servers, Internet, Cluster computing**

Features

It supports features like −

- Powerful, cheap, reliable and easy to use.
- Portable and faster due to use of parallel processors and Super Large Scale Integrated Circuits.
- Introduction of Artificial Intelligence and Expert Systems
- Rapid software development is possible.
- Can recognize Images and Graphics

Memory

The capacity of the memory is **unlimited**.

Data Input

The input is provided through CDROM, Optical Disk and other touch and voice sensitive input devices.

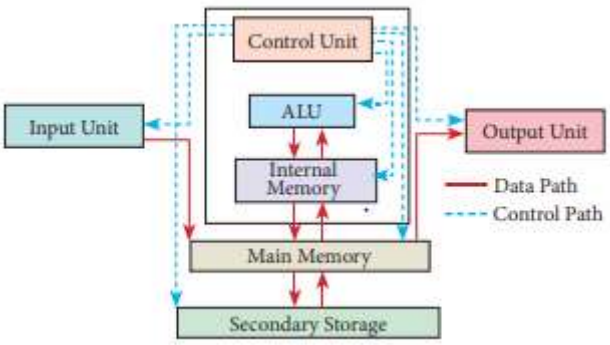
Examples

The examples of fifth generation computers are −

- IBM
- Pentium
- PARAM

COMPONENTS OF COMPUTERS

- The computer is the combination of hardware and software. Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc., while software is the set of programs or instructions. Both hardware and software together make the computer system to function.
- Every task given to a computer follows an Input- Process- Output Cycle (IPO cycle). It needs certain input, processes that input and produces the desired output.
- The input unit takes the input, the central processing unit does the processing of data and the output unit produces the output. The memory unit holds the data and instructions during the processing.



Components of a computer

Input Unit

This unit contains devices with the help of which we **enter data into the computer**. This unit creates a link between the user and the computer. The input devices translate the information into a form understandable by the computer.

CPU (Central Processing Unit)

CPU is considered as the **brain of the computer**. CPU performs all types of data processing operations. It stores data, intermediate results, and instructions (program). It controls the operation of all parts of the computer.

- Central Processing Unit (CPU) consists of the following features −
- CPU is considered as the brain of the computer.
- CPU performs all types of data processing operations.

- It stores data, intermediate results, and instructions (program).
- It controls the operation of all parts of the computer.

CPU itself has the following three components −

- ALU (Arithmetic Logic Unit)
- Memory Unit
- Control Unit

Memory or Storage Unit

This unit can store instructions, data, and intermediate results. This unit supplies information to other units of the computer when needed. It is also known as internal storage unit or the main memory or the **primary storage or Random Access Memory (RAM).**
Its size affects speed, power, and capability. Primary memory and secondary memory are two types of memories in the computer.

Functions of the memory unit are −

- It stores all the data and the instructions required for processing.
- It stores intermediate results of processing.
- It stores the final results of processing before these results are released to an output device.
- All inputs and outputs are transmitted through the main memory.

Control Unit

This unit controls the operations of all parts of the computer but **does not carry** out any actual data processing operations.

Functions of this unit are −

- It is responsible for controlling the transfer of data and instructions among other units of a computer.
- It **manages and coordinates** all the units of the computer.
- It obtains the instructions from the memory, interprets them, and directs the operation of the computer.
- It communicates with Input/output devices for transfer of data or results from storage.
- It **does not process or store data.**

ALU (Arithmetic Logic Unit)

This unit consists of two subsections namely,

- Arithmetic Section

- Logic Section

Arithmetic Section

Function of arithmetic section is to **perform arithmetic operations** like addition, subtraction, multiplication, and division. All complex operations are done by making repetitive use of the above operations.

Logic Section

Function of logic section is to **perform logic operations** such as comparing, selecting, matching, and merging of data.

Output Unit

The output unit consists of devices with the help of which we get the information from the computer. This unit is a link between the computer and the users. Output devices translate the computer's output into a form understandable by the users.

Example: Monitor, Printer etc.

INPUT AND OUTPUT DEVICES

INPUT DEVICES:

An input device is a **piece of computer hardware equipment used to provide data and control signals to an information processing system** such as a computer or information appliance. Examples of input devices include **Keyboards, mouse, scanners, digital cameras, joysticks, Barcode Readers, Light Pen and microphones**.

Following are some of the important input devices which are used in a computer −

Keyboard: The keyboard is a basic input device that is used to enter data into a computer or any other electronic device **by pressing keys**. It has different sets of keys for letters, numbers, characters, and functions. Keyboards are connected to a computer through USB or a Bluetooth device for wireless communication.

Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet. The keys on the keyboard are as follows

Keys	Description
Typing Keys	These keys include the letter keys (A-Z) and digit keys (0-9) which generally give the same layout as that of typewriters.

Numeric Keypad	It is used to enter the numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machines and calculators.
Function Keys	The twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has a unique meaning and is used for some specific purpose.
Control keys	These keys provide cursor and screen control. It includes four directional arrow keys. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc)
Special Purpose Keys	Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

Mouse: The mouse is a hand-held input device which is used to **move cursor or pointer** across the screen. It is designed to be used on a flat surface and generally has left and right button and a **scroll wheel** between them.

Laptop computers come with a **touchpad** that works as a mouse. It lets you control the movement of cursor or pointer by moving your finger over the touchpad. Some mouse comes with integrated features such as extra buttons to perform different buttons.

Common types of the mouse:

- Trackball Mouse
- Mechanical Mouse
- Optical Mouse
- Cordless or Wireless Mouse

Scanner: The scanner uses the pictures and pages of text as input. It **scans the picture or a document.** The scanned picture or document then converted into a **digital format** or file and is displayed on the screen as an output. It uses optical character recognition techniques to convert images into digital ones.

Some of the common types of scanners are as follows:

- Flatbed Scanner
- Handheld Scanner
- Sheet fed Scanner

- Drum Scanner
- Photo Scanner

Joystick: A joystick is also a pointing input device like a mouse. It is made up of a **stick with a spherical base**. The base is fitted in a socket that allows free movement of the stick. The movement of stick controls the cursor or pointer on the screen.

Light Pen: A light pen is a computer input device that looks like a pen. The tip of the light pen contains a **light-sensitive detector** that enables the user to point to or select objects on the display screen. Its light sensitive tip detects the object location and sends the corresponding signals to the CPU.

Digitizer: Digitizer is a computer input device that has a flat surface and usually comes with a stylus. It enables the user **to draw images** and graphics using the stylus as we draw on paper with a pencil. The images or graphics drawn on the digitizer appear on the computer monitor or display screen. The software converts the touch inputs into lines and can also convert handwritten text to typewritten words.

Microphone: The microphone is a computer input device that is used to **input the sound.** It receives the sound vibrations and converts them into audio signals or sends to a recording medium. The audio signals are **converted into digital data** and stored in the computer.

Magnetic Ink Character Recognition (MICR): MICR computer input device is designed to read the text printed with magnetic ink. MICR is a character recognition technology that makes use of special magnetized ink which is sensitive to magnetic fields. It is widely used in banks to process the cheques and other organizations where security is a major concern.

Optical Character Reader (OCR): OCR computer input device is designed to convert the scanned images of handwritten, typed or printed text into digital text. It is widely used in offices and libraries to convert documents and books into electronic files.

Bar Code Readers: Bar Code Reader is a device used for reading bar coded data (data in the form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books, etc. It may be a handheld scanner or may be embedded in a stationary scanner

Optical Mark Reader (OMR): OMR is a special type of optical scanner used to recognize the type of mark made by pen or pencil. It is used where one out of a few alternatives is to be selected and marked.

OUTPUT DEVICES:

The output device displays the result of the **processing of raw data that is entered in the computer through an input device**. There are a number of output devices that display output in different ways such as text, images, hard copies, and audio or video.

Following are some of the important output devices used in a computer.

- **Monitors**
- **Graphic Plotter**
- **Printer**
- **Projector**

Monitor: Monitors, commonly called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from **tiny dots, called pixels** that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)
- Flat-Panel Display

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. It takes **more than one illuminated pixel** to form a whole character, such as the letter 'e' in the word help.

A finite number of characters can be displayed on a **screen at once**. The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed. Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically.

There are some disadvantages of CRT −

- Large in Size
- High power consumption

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, and graphics display.

The flat-panel display is divided into two categories −

- **Emissive Displays**: Emissive displays are devices that convert electrical energy into light. For example, plasma panel and LED (Light-Emitting Diodes).

- **Non-Emissive Displays**: Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. For example, LCD (Liquid-Crystal Device).

Printer:

A printer produces **hard copies** of the processed data. It enables the user, to print images, text or any other information onto the paper.

Based on the printing mechanism, the printers are of two types: Impact Printers and Non-impact Printers.

1. Impact Printers: They are of two types:

- Character Printers
  - ✓ Dot Matrix printers
  - ✓ Daisy Wheel printers
- Line printers
  - ✓ Drum printers
  - ✓ Chain printers

2. Non-impact printers: They are of two types:

- Laser printers
- Inkjet printers

Projector: A projector is an output device that enables the user to project the output onto a large surface such as a big screen or wall. It can be connected to a computer and similar devices to project their output onto a screen. It uses **light and lenses** to produce magnified texts, images, and videos. So, it is an ideal output device to give presentations or to teach a large number of people.

Computer Memory

Memory is the best essential **element of a computer** because computer can't perform simple tasks. The performance of computer mainly based on **memory and CPU**. Memory is internal storage media of computer that has several names such as majorly categorized into two types,

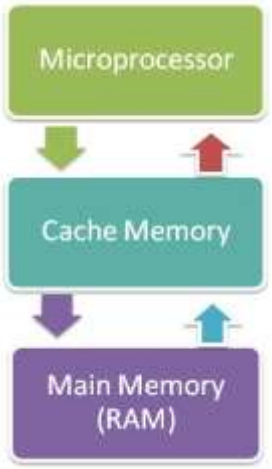
1. Main memory/ Primary Memory
2. Secondary Memory

Primary Memory:

Primary memory is computer memory that a **processor or computer accesses first or directly**. It allows a processor to **access running** execution applications and services that are temporarily stored in a specific memory location. Primary memory is also known as primary storage or main memory

1. RAM (Volatile Memory).
2. ROM (Non-Volatile Memory).

Random Access Memory (RAM):



It is a **volatile memory**. It means it does not store data or instructions permanently. It is read/write memory which stores data till the machine is working. When you switch on the computer and perform some task the data and instructions from the hard disk are stored in RAM.

CPU utilizes this data to perform the required tasks. As soon as you shut down the computer the RAM loses all the data.

RAM categorized into following types.

1. DRAM- Dynamic memory must be **constantly refreshed**, or it loses its contents. This type of memory is more economical.

2. SRAM- SRAM is faster and less volatile than DRAM but requires more power and is more expensive. It **does not need to be refreshed** like a DRAM.

3. SDRAM(Synchronous Dynamic Random-Access Memory) - A type of DRAM that can run at much higher clock speeds.

Read Only Memory (ROM):

It is a non-volatile memory. It means it does not lose its data or programs that are written on it at the time of manufacture. So it is a permanent memory that contains all important data and instructions needed to perform important tasks like the boot process.

ROM memory has several models such names are following.

1. PROM: Programmable Read Only Memory (PROM) maintains large storage media but **can't offer the erase** features in ROM. This type of RO maintains PROM chips to write data once and read many. The programs or instructions designed in PROM can't be erased by other programs.

2. EPROM : Erasable Programmable Read Only Memory designed for recover the problems of PROM and ROM. Users can **delete the data of EPROM** thorough pass on **ultraviolet light** and it **erases chip** is reprogrammed.

3. EEPROM: Electrically Erasable Programmable Read Only Memory similar to the EPROM but it uses **electrical beam for erase** the data of ROM.

Some other memories are

❖ **Register Memory:**

Register memory is the smallest and fastest memory in a computer. It is located in the CPU in the form of registers. A **register temporarily holds frequently used data**, instructions and memory address that can be quickly accessed by the CPU.

❖ **Cache Memory:**

It is small in size but faster than the main memory. The CPU can access it more quickly than the primary memory. It holds the **data and programs frequently used** by the CPU. So if the CPU finds the required data or instructions in cache memory it doesn't need to access the primary memory (RAM). Thus, it speeds up the system performance.

❖ **Semi-volatile memory:**

A third category of memory is "semi-volatile". The term is used to describe a memory which has **some limited non-volatile duration after power** is removed, but then data is ultimately lost. A typical goal when using a semi-volatile memory is to provide high performance/durability/etc. associated with volatile memories, while providing some benefits of a true non-volatile memory.

❖ **Virtual memory:**

Virtual memory is a system where all physical memory is controlled by the operating system. When a program needs memory, it **requests it from the operating system**. The operating system then decides in what **physical location to place the program's** code and data.

❖ **Protected memory:**

Protected memory is a system where **each program is given an area of memory to use** and is not permitted to go outside that range. Use of protected memory greatly enhances both the reliability and security of a computer system.

Secondary Memory:

The storage devices in the computer or connected to the computer are known as secondary memory of the computer. It is **non-volatile in nature so permanently stores** the data even when the computer is turned off. The CPU can't directly access the secondary memory. First the secondary memory data is transferred to primary memory then CPU can access it. Common secondary storage devices are the hard disk and optical disks. The hard disk has enormous storage capacity compared to main memory.

There are three main types of secondary storage in a computer system:

- **Solid state storage devices** (such as USB memory sticks): Solid state storage is also faster than traditional hard disk drives because the data is stored electrically in silicon chips called cells. Within the cells, the binary data is stored by holding an electrical current in a transistor with an on / off mode.
- **Optical storage devices** (such as CD, DVD and Blue-ray discs): Optical devices use a laser to scan the surface of a spinning disc made from metal and plastic. The disc surface is divided into tracks, with each track containing many flat areas and hollows. The flat areas are known as lands and the hollows as pits.
- **Magnetic storage devices** (such as hard disk drives): Magnetic devices such as hard disk drives use magnetic fields to magnetise tiny individual sections of a metal spinning disk. Each tiny section represents one bit. A magnetised section represents a binary '1' and a demagnetized section represents a binary '0'.

Hard drive: It is a non-removable storage device containing magnetic disks or platters rotating at high speeds. The hard drives store data in **segments of concentric circles.** It may spin at 5,400 to 15,000 RPM.

Optical disk: an electronic data storage medium that can be written to and read using a low-powered laser beam.

- **CD-ROM:** "Read only" (used for distribution of commercial software, for example) Standard storage capacity is 640MB.
- **CD-R** (or CD-WORM): "Write Once, Read Many" times
- **CD-RW:** rewritable multiple times
- **DVD:** similar to CD, but with significantly larger storage capacity (4.7GB)
- **Write once read many (WORM)** describes a data storage device in which information, once written, cannot be modified

Floppy Disk: Floppy disk is composed of a thin, flexible magnetic disk sealed in a square plastic carrier. Floppy disks were widely used to distribute software, transfer files, and create backup copies of data. To read and write data from a floppy disk, a computer system must have a floppy disk drive (FDD).

Magnetic Tape: Magnetic tape used in recording sound, pictures, or computer data.

Flash memory: a kind of memory that retains data in the **absence of a power supply**.

Primary memory	Secondary memory
The primary memory is categorized as volatile & nonvolatile memories.	The secondary memory is always a non-volatile memory.
These memories are also called internal memory.	Secondary memory is known as a Backup memory or Additional memory or Auxiliary memory.
Data is directly accessed by the processing unit.	Data cannot be accessed directly by the processor. It is first copied from secondary memory to primary memory. Only then CPU can access it.
It holds data or information that is currently being used by the processing unit. Capacity is usually in 16 to 32 GB	It stores a substantial amount of data and information. Capacity is generally from 200GB to terabytes.
Primary memory can be accessed by the data bus.	Secondary memory is accessed by I/O channels.
Primary memory is costlier than secondary memory.	Secondary memory is cheaper than primary memory.

Memory unit

Memory unit is the **amount of data that can be stored in the storage unit**. This storage capacity is expressed in terms of **Bytes**.

Unit	Description
Bit (Binary Digit)	A binary digit is logical 0 and 1 representing a passive or an active state of a component in an electric circuit.
Nibble	A group of 4 bits is called nibble.
Byte	A group of 8 bits is called byte. A byte is the smallest unit, which can represent a data item or a character.
Kilobyte (KB)	1 KB = 1024 Bytes
Megabyte (MB)	1 MB = 1024 KB
GigaByte (GB)	1 GB = 1024 MB
TeraByte (TB)	1 TB = 1024 GB

PetaByte (PB)	1 PB = 1024 TB
Exa Byte	1 EB = 1024 PB
Zetta Byte	1 ZB = 1024 EB
Yotta Byte	1 YB = 1024 ZB

Programming Languages

The computer system is simply a machine and hence it cannot perform any work; therefore, in order to make it functional different languages are developed, which are known as programming languages or simply computer languages.

Languages comes with its own set of vocabulary and rules, better known as syntax

Following are the major categories of Programming Languages −

1. Machine Language
2. Assembly Language
3. High Level Language
4. System Language
5. Scripting Language

Machine Language or Code

This is the language that is written for the computer hardware. Such language is effected directly by the central processing unit (CPU) of a computer system.

Assembly Language

It is a language of an encoding of machine code that makes simpler and readable.

High Level Language

The high level language is simple and easy to understand and it is similar to English language. For example, COBOL, FORTRAN, BASIC, C, C+, Python, etc.

Computer Network Types

A computer network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.

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A computer network can be categorized by their size. A computer network is mainly of four types:

- LAN(Local Area Network)
- PAN(Personal Area Network)
- MAN(Metropolitan Area Network)
- WAN(Wide Area Network)

LAN (Local Area Network):

- Local Area Network is a group of computers connected to each other in a **small area** such as building, office.
- LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial cable, etc.
- It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.
- The data is transferred at an extremely faster rate in Local Area Network.

PAN (Personal Area Network):

- Personal Area Network is a network arranged **within an individual person, typically within a range of 10 meters.**
- Personal Area Network is used for connecting the computer devices of personal use is known as Personal Area Network.
- Thomas Zimmerman was the first research scientist to bring the idea of the Personal Area Network.
- Personal Area Network covers an area of 30 feet.
- Personal computer devices that are used to develop the personal area network are the laptop, mobile phones, media player and play stations.

There are two types of Personal Area Network:

- **Wireless Personal Area Network:** Wireless Personal Area Network is developed by simply using wireless technologies such as WiFi, Bluetooth. It is a low range network.
- **Wired Personal Area Network:** Wired Personal Area Network is created by using the USB

MAN (Metropolitan Area Network):

- A metropolitan area network is a network that covers a **larger geographic area** by interconnecting a different LAN to form a larger network.
- Government agencies use MAN to connect to the citizens and private industries.

WAN (Wide Area Network):

- A Wide Area Network is a network that extends over a large geographical area such as **states or countries.**

- A Wide Area Network is quite bigger network than the LAN.
- A Wide Area Network is not limited to a single location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.
- The internet is one of the biggest WAN in the world.
- A Wide Area Network is widely used in the field of Business, government, and education.

Internetwork:

- An internetwork is defined **as two or more computer network** LANs or WAN or computer network segments are connected using devices, and they are configured by a local addressing scheme. This process is known as internetworking.
- An interconnection between public, private, commercial, industrial, or government computer networks can also be defined as internetworking.
- An internetworking uses the internet protocol.
- The reference model used for internetworking is Open System Interconnection (OSI).

Types of Internetwork:

- **Extranet:** An extranet is a **communication network** based on the internet protocol such as Transmission Control protocol and internet protocol.
- **Intranet:** An intranet is a **private network** based on the internet protocol such as Transmission Control protocol and internet protocol.

Logic gates and Boolean operations

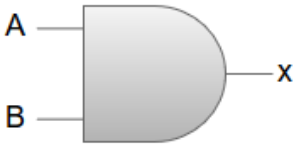
Logic Gates:

The logic gates are the main structural part of a digital system.

- Logic Gates are a **block of hardware** that produces signals of binary 1 or 0 when input logic requirements are satisfied.
- Each gate has a distinct graphic symbol, and its operation can be described by means of algebraic expressions.
- The **seven** basic logic gates includes: AND, OR, XOR, NOT, NAND, NOR, and XNOR.
- The relationship between the input-output binary variables for each gate can be represented in tabular form by a truth table.
- Each gate has one or two binary input variables designated by A and B and one binary output variable designated by x.

AND GATE:

The AND gate is an electronic circuit which gives a **high output only if all its inputs are high.** The AND operation is represented by a dot (.) sign.



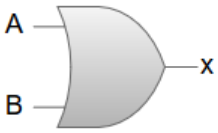
Algebraic Function: x = AB

Truth Table:

A	B	x
0	0	0
0	1	0
1	0	0
1	1	1

OR GATE:

The OR gate is an electronic circuit which gives a **high output if one or more of its inputs are high.** The operation performed by an OR gate is represented by a plus (+) sign.



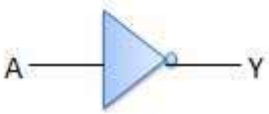
Algebraic Function: x = A + B

Truth Table:

A	B	x
0	0	0
0	1	1
1	0	1
1	1	1

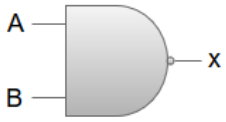
NOT GATE:

The NOT gate is an electronic circuit which produces an **inverted version of the input at its output.** It is also known as an Inverter.



NAND GATE:

The NOT-AND (NAND) gate which is **equal to an AND gate followed by a NOT gate.** The NAND gate gives a high output if any of the inputs are low. The NAND gate is represented by a AND gate with a small circle on the output. The small circle represents inversion.



Algebraic Function: x = (AB)'

Truth Table:

A	B	x
0	0	1
0	1	1
1	0	1
1	1	0

NOR GATE:

The NOT-OR (NOR) gate which is equal to an **OR gate followed by a NOT gate.** The NOR gate gives a low output if any of the inputs are high. The NOR gate is represented by an OR gate with a small circle on the output. The small circle represents inversion.

Algebraic Function: x = (A+B)'

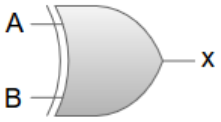
Truth Table:

A	B	x
0	0	1
0	1	0
1	0	0
1	1	0

Exclusive-OR/ XOR GATE:

The 'Exclusive-OR' gate is a circuit which will give a **high output if one of its inputs is high but not both of them.** The XOR operation is represented by an encircled plus sign.

XOR Gate:



Algebraic Function: $x = A \oplus B$

or

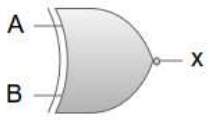
$x = A'B + AB'$

Truth Table:

A	B	x
0	0	0
0	1	1
1	0	1
1	1	0

EXCLUSIVE-NOR/Equivalence GATE:

The 'Exclusive-NOR' gate is a circuit that does the **inverse operation to the XOR gate**. It will give a low output if one of its inputs is high but not both of them. The small circle represents inversion.



Algebraic Function: $x = (A \oplus B)'$

or

$x = A'B' + AB$

Truth Table:

A	B	x
0	0	1
0	1	0
1	0	0
1	1	1

Boolean algebra

Boolean algebra can be considered as an algebra that **deals with binary variables and logic operations.** Boolean algebraic variables are designated by letters such as A, B, x, and y. The basic operations performed are AND, OR, and complement.

The Boolean algebraic functions are mostly expressed with binary variables, logic operation symbols, parentheses, and equal sign. For a given value of variables, the Boolean function can be either 1 or 0.

Number System

When we type some letters or words, the computer translates them in numbers as computers can understand only numbers. A computer can understand the **positional number system** where there are only a few symbols called digits and these symbols represent different values depending on the position they occupy in the number.

The value of each digit in a number can be determined using −

- The digit
- The position of the digit in the number
- The base of the number system (where the base is defined as the total number of digits available in the number system)

Decimal Number System:

The number system that we use in our day-to-day life is the decimal number system. Decimal number system has base 10 as it uses 10 digits from **0 to 9.** In decimal number system, the successive positions to the left of the decimal point represent units, tens, hundreds, thousands, and so on.

S.No.	Number System and Description
1	**Binary Number System** Base 2. Digits used : 0, 1
2	**Octal Number System** Base 8. Digits used : 0 to 7
3	**Hexa Decimal Number System** Base 16. Digits used: 0 to 9, Letters used : A- F

Binary Number System

Characteristics of the binary number system are as follows −

- Uses two digits, **0 and 1**
- Also called as base 2 number system
- Each position in a binary number represents a 0 power of the base (2). Example 20
- Last position in a binary number represents a x power of the base (2). Example 2x where x represents the last position - 1.

Octal Number System:

Characteristics of the octal number system are as follows −

- Uses eight digits, 0,1,2,3,4,5,6,7
- Also called as base 8 number system

- Each position in an octal number represents a 0 power of the base (8). Example 80
- Last position in an octal number represents a x power of the base (8). Example 8x where x represents the last position – 1

Hexadecimal Number System:

Characteristics of hexadecimal number system are as follows −

- Uses 10 digits and 6 letters, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
- Letters represent the numbers starting from 10. A = 10. B = 11, C = 12, D = 13, E = 14, F = 15
- Also called as base 16 number system
- Each position in a hexadecimal number represents a 0 power of the base (16). Example, 160
- Last position in a hexadecimal number represents a x power of the base (16). Example 16x where x represents the last position – 1

COMPUTER SECURITY

Computer security, **cyber-security** or information technology security (IT security) is the protection of computer systems from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.

Internet security is a branch of computer security specifically related to not only Internet, often involving browser security and the World Wide Web. Its objective is to establish rules and measures to use against attacks over the Internet. The Internet represents an insecure channel for exchanging information, which leads to a high risk of intrusion or fraud, such as phishing, online viruses, Trojans, worms and more. Many methods are used to protect the transfer of data, including encryption and from-the-ground-up engineering.

Types of attacks:

A cyber-attack is an exploitation of computer systems and networks. It uses **malicious code** to alter computer code, logic or data and lead to cybercrimes, such as information and identity theft.

Attacks can be classified into the following categories:

1. Web-based attacks

2. System-based attacks

Web-based attacks

These are the attacks which occur on a **website or web applications**. Some of the important web-based attacks are as follows-

Injection attacks

It is the attack in which some data will be injected into a **web application** to manipulate the application and fetch the required information.

Example- SQL Injection, code Injection; log Injection, XML Injection etc.

DNS Spoofing

DNS spoofing is a type of computer **security hacking**. Whereby a data is introduced into a DNS resolver's cache causing the name server to return an **incorrect IP address**, diverting traffic to the attacker's computer or any other computer. The DNS spoofing attacks can go on for a long period of time without being detected and can cause serious security issues.

Session Hijacking

It is a security attack on a user session over a protected network. Web applications create cookies to store the state and user sessions. By **stealing the cookies**, an attacker can have access to all of the user data.

Phishing

Phishing is a type of attack which attempts to steal sensitive information like user **login credentials and credit card number.** It occurs when an attacker is masquerading as a trustworthy entity in electronic communication.

Brute force

It is a type of attack which uses a **trial and error method**. This attack generates a large number of guesses and validates them to obtain actual data like **user password and personal identification number**. This attack may be used by criminals to crack encrypted data, or by security, analysts to test an organization's network security.

Denial of Service

It is an attack which meant to make a server or network resource **unavailable to the users**. It accomplishes this by flooding the target with traffic or sending it information that triggers a crash. It uses the single system and single internet connection to attack a server. It can be classified into the following-

- Volume-based attacks- Its goal is to saturate the bandwidth of the attacked site, and is measured in bit per second.
- Protocol attacks- It consumes actual server resources, and is measured in a packet.
- Application layer attacks- Its goal is to crash the web server and is measured in request per second.

Dictionary attacks

This type of attack stored the list of a commonly used password and validated them to get original password.

URL Interpretation

It is a type of attack where we can change the certain parts of a **URL,** and one can make a web server to deliver web pages for which he is not authorized to browse.

File Inclusion attacks

It is a type of attack that allows an attacker to access unauthorized or essential files which is **available on the web server** or to execute malicious files on the web server by making use of the include functionality.

Man in the middle attacks

It is a type of attack that allows an attacker to **intercepts the connection** between client and server and acts as a bridge between them. Due to this, an attacker will be able to read, insert and modify the data in the intercepted connection.

System-based attacks

These are the attacks which are intended to compromise a computer or a computer network. Some of the important system-based attacks are as follows-

1. Virus:

A **computer virus** is a type of malicious software that, when executed, replicates itself by modifying other computer programs and inserting its own code. When this replication succeeds, the affected areas are then said to be **"infected"** with a computer virus.

A virus can be spread by opening an email attachment, clicking on an executable file, visiting an infected website or viewing an infected website advertisement. It can also be spread through infected removable storage devices, such USB drives. Once a virus has infected the host it has the capacity to corrupt or to delete data on your computer and it can utilize an email program to spread the virus to other computer systems .In the worst case scenario, it can even delete everything on your hard disk .The purpose of it is to disrupt the operation of the computer or the program.

Ripper, Stuxnet, Petya, Wanna cry, Code red, Melissa, Sasser, Zeus, Mydoom, Crypto Locker, Flashback are some example of Viruses.

2. Computer Worm:

A computer worm is a malicious, **self-replicating** software program (malware) which affects the functions of software and hardware programs.

Before widespread use of networks, computer worms were spread through infected storage media, such as floppy diskettes, which, when mounted on a system, would infect other storage devices connected to the victim system. USB drives are still a common vector for computer worms.

Differences between worms and viruses:

Computer worms "are self-replicating programs that spread with no human intervention after they are started." In contrast, "viruses are also self-replicating programs, but usually require some action on the part of the user to spread inadvertently to other programs or systems."

3. Trojan horse:

Trojan horse or Trojan is any malware which misleads users of its true intent. Trojans are generally spread by **some form of social engineering**, for example where a user is duped into executing an e-mail attachment disguised to appear not suspicious, (e.g., a routine form to be filled in), or by clicking on some fake advertisement on social media or anywhere else.

Trojans may allow an attacker to access users' personal information such as banking information, passwords, or personal identity. It can also delete a user's files or infect other devices connected to the network. Ransomware attacks are often carried out using a Trojan. After it is activated, it can achieve any number of attacks on the host, from irritating the user (popping up windows or changing desktops) to damaging the host (deleting files, stealing data, or activating and spreading other malware, such as viruses). Trojans are also known to create backdoors to give malicious users access to the system.

Unlike computer viruses and worms, Trojans generally do not attempt to inject themselves into other files or otherwise propagate themselves.

4. Malware:

Short for **mal**icious soft**ware**, is any software used to disrupt computer operation, gather sensitive information, or gain access to private computer systems. It can appear in the form of executable code, scripts, active content, and other software.

5. Ransomware:

Ransomware is a type of malware program that infects and **takes control of a system**. It infects a computer with the intention of extorting money from its owner.

6. Spyware:

Spyware is unwanted software that infiltrates your computing device, stealing your internet usage data and sensitive information. Spyware is classified as a type of malware designed to gain access to or damage your computer, often without your knowledge. Just like viruses, spyware can be installed when you **open an e-mail attachment**

containing the malicious software or through cookies. It can also be installed when you install another program that has a spyware installer attached to it.

7. Adware:

Adware, or advertising-supported software, is software that generates revenue for its developer by automatically **generating online advertisements** in the user interface of the software or on a screen presented to the user during the installation process. The software may generate two types of revenue: one is for the display of the advertisement and another on a "pay-per-click" basis, if the user clicks on the advertisement. The software may implement advertisements in a variety of ways, including a static box display, a banner display, full screen, a video, pop-up ad or in some other form.

8. Key logger:

A key logger is a type of malware that **stores all keystrokes of a computer**. It can record all sorts of personal information, such as usernames, passwords, credit card numbers, and personal documents such as emails and reports.

9. Phishing:

Phishing is the fraudulent attempt to obtain **access credentials** such as usernames, passwords and credit card details by disguising oneself as a trustworthy entity in an electronic communication. Typically carried out by email spoofing or instant messaging,it often directs users to enter personal information at a fake website which matches the look and feel of the legitimate site.

10. Spoofing:

A Spoofing attack is a situation in which one person or program successfully represents oneself as another by falsifying data and thereby gaining an illegitimate advantage.

11. Pharming:

Pharming is a cyber-attack intended to redirect a **website's traffic** to another, fake site. Pharming can be conducted either by changing the hosts file on a victim's computer or by exploitation of a vulnerability in DNS server software. DNS servers are computers responsible for resolving Internet names into their real IP addresses.

User of online banking and e-commerce websites are more prone to this attack.

IMPORTANT TERMS:

1. **Anti-virus** software is a program or set of programs that are designed to prevent, search for, detect, and remove software viruses, and other malicious software like worms, trojans, and adware.

2. **Firewall** is a network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules

3. **Authorization** is the function of specifying access rights to resources related to information security and computer security in general and to access control in particular. More formally, "to authorize" is to define an access policy.

4. **Authentication** is the act of confirming the truth of an attribute of a single piece of data or entity. It might involve confirming the identity of a person by validating their identity documents, verifying the validity of a website with a digital certificate, tracing the age of an artifact by carbon dating, or ensuring that a product is what its packaging and labeling claim to be. In other words, Authentication often involves verifying the validity of at least one form of identification.

5. A person who uses his or her expertise to gain access to other people's computers to get information illegally or do damage is a **Hacker**.

6. **Zombie** is a computer connected to the Internet that has been compromised by a hacker, computer virus or trojan horse program and can be used to perform malicious tasks of one sort or another under remote direction.

7. **Breach** is the moment a hacker successfully exploits vulnerability in a computer or device, and gains access to its files and network.

8. **Bot/Botnet is** a type of software application or script that performs tasks on command, allowing an attacker to take complete control remotely of an affected computer. A collection of these infected computers is known as a "botnet" and is controlled by the hacker or "bot-herder".

9. **Spam** is unwanted emails. In other words we can call them as unsolicited promotional mail.

10. **Encryption** is the method by which plaintext or any other type of data is converted from a readable form to an encoded version that can only be decoded by another entity if they have access to a decryption key. Encryption is one of the most important methods for providing data security, especially for end-to-end protection of data transmitted across networks.

SHORTCUT KEYS

KEYBOARD SHORTCUTS:

Shortcut keys	Description
Alt + F	File menu options in current program
Alt + E	Edit options in current program
Ctrl +A	Select all text
Ctrl + F	Find
Ctrl +X	Cut selected item
Shift + Del	Delete permanently
Ctrl + C	Copy selected item
Ctrl + Insert	Copy selected item

Ctrl + V	Paste
Shift + Insert	Paste
Home	Go to beginning of current line
Ctrl + Home	Go to beginning of document
End	Go to end of current line
Ctrl + End	Go to end of document
Shift + Home	Highlight from current position to beginning of line
Shift + End	Highlight from current position to end of line
Ctrl + <--	Move one word to the left at a time
Ctrl + -->	Move one word to the right at a time

MICROSOFT WORD

Shortcut	Description
Ctrl+0	Toggles 6pts of spacing before a paragraph.
Ctrl+A	Select all contents of the page.
Ctrl+B	Bold highlighted selection.
Ctrl+C	Copy selected text.
Ctrl+D	Open the font preferences window.
Ctrl+E	Aligns the line or selected text to the center of the screen.
Ctrl+F	Open find box.
Ctrl+I	Italic highlighted selection.
Ctrl+J	Aligns the selected text or line to justify the screen.
Ctrl+K	Insert a hyperlink.
Ctrl+L	Aligns the line or selected text to the left of the screen.
Ctrl+M	Indent the paragraph.
Ctrl+N	Opens new, blank document window.

Ctrl+O	Opens the dialog box or page for selecting a file to open.
Ctrl+P	Open the print window.
Ctrl+R	Aligns the line or selected text to the right of the screen.
Ctrl+S	Save the open document. Like Shift+F12.
Alt, F, A	Save the document under a different file name.
Ctrl+T	Create a hanging indent.
Ctrl+U	Underline the selected text.
Ctrl+V	Paste.
Ctrl+W	Close the currently open document.
Ctrl+X	Cut selected text.
Ctrl+Y	Redo the last action performed.
Ctrl+Z	Undo last action.
Ctrl+Shift+L	Quickly create a bullet point.
Ctrl+Shift+F	Change the font.
Ctrl+Shift+>	Increase selected font +1pts up to 12pt and then increase font +2pts.
Ctrl+]	Increase selected font +1pts.
Ctrl+Shift+<	Decrease selected font -1pts if 12pt or lower; if above 12, decreases font by +2pt.
Ctrl+[	Decrease selected font -1pts.
Ctrl+/+c	Insert a cent sign (¢).
Ctrl+'+<char>	Insert a character with an accent (grave) mark, where <char> is the character you want. For example, if you wanted an accented è you would

	use **Ctrl+'+e** as your shortcut key. To reverse the accent mark use the opposite accent mark, often on the tilde key.
Ctrl+Shift+*	View or hide non printing characters.
Ctrl+<left arrow>	Moves one word to the left.
Ctrl+<right arrow>	Moves one word to the right.
Ctrl+<up arrow>	Moves to the beginning of the line or paragraph.
Ctrl+<down arrow>	Moves to the end of the paragraph.
Ctrl+Del	Deletes word to right of cursor.
Ctrl+Backspace	Deletes word to left of cursor.
Ctrl+End	Moves the cursor to the end of the document.
Ctrl+Home	Moves the cursor to the beginning of the document.
Ctrl+Spacebar	Reset highlighted text to the default font.
Ctrl+1	Single-space lines.
Ctrl+2	Double-space lines.
Ctrl+5	1.5-line spacing.
Ctrl+Alt+1	Changes text to heading 1.
Ctrl+Alt+2	Changes text to heading 2.
Ctrl+Alt+3	Changes text to heading 3.
Alt+Ctrl+F2	Open new document.
Ctrl+F1	Open the Task Pane.
Ctrl+F2	Display the print preview.
Ctrl+Shift+>	Increases the selected text size by one font size.

Ctrl+Shift+<	Decreases the selected text size by one font size.
Ctrl+Shift+F6	Switches to another open Microsoft Word document.
Ctrl+Shift+F12	Prints the document.
F1	Open help.
F4	Repeat the last action performed (Word 2000+).
F5	Open the *Find*, *Replace*, and *Go To* window in Microsoft Word.
F7	Spellcheck and grammar check selected text or document.
F12	Save As.
Shift+F3	Change the text in Microsoft Word from uppercase to lowercase or a capital letter at the beginning of every word.
Shift+F7	Runs a Thesaurus check on the selected word.
Shift+F12	Save the open document. Like Ctrl+S.
Shift+Enter	Create a soft break instead of a new paragraph.
Shift+Insert	Paste.
Shift+Alt+D	Insert the current date.
Shift+Alt+T	Insert the current time.

EXCEL:

Shortcut	Description
Tab	Move to the next cell, to the right of the currently selected cell.
Ctrl+A	Select all contents of a worksheet.
Ctrl+B	Bold all cells in the highlighted section.

Ctrl+C	Copy all cells in the highlighted section.
Ctrl+D	Fill down. Fills the cell beneath with the contents of the selected cell. To fill more than one cell, select the source cell and press **Ctrl+Shift+Down**to select multiple cells. Then press **Ctrl+D** to fill them with the contents of the original cell.
Ctrl+F	Search current sheet.
Ctrl+G	Go to a certain area.
Ctrl+H	Find and replace.
Ctrl+I	Puts italics on all cells in the highlighted section.
Ctrl+K	Inserts a hyperlink.
Ctrl+N	Creates a new workbook.
Ctrl+O	Opens a workbook.
Ctrl+P	Print the current sheet.
Ctrl+R	Fill right. Fills the cell to the right with the contents of the selected cell. To fill more than one cell, select the source cell and press **Ctrl+Shift+Right**to select multiple cells. Then press **Ctrl+R** to fill them with the contents of the original cell.
Ctrl+S	Saves the open worksheet.
Ctrl+U	Underlines all cells in the highlighted section.
Ctrl+V	Pastes everything copied onto the clipboard.
Ctrl+W	Closes the current workbook.
Ctrl+X	Cuts all cells in the highlighted section.

Ctrl+Y	Repeats the last entry.
Ctrl+Z	Undo the last action.
Ctrl+1	Changes the format of the selected cells.
Ctrl+2	Bolds all cells in the highlighted section.
Ctrl+3	Puts italics all cells in the highlighted section.
Ctrl+4	Underlines all cells in highlighted section.
Ctrl+5	Puts a strikethrough all cells in the highlighted section.
Ctrl+6	Shows or hides objects.
Ctrl+7	Shows or hides the toolbar.
Ctrl+8	Toggles the outline symbols.
Ctrl+9	Hides rows.
Ctrl+0	Hides columns.
Ctrl+Shift+:	Enters the current time.
Ctrl+;	Enters the current date.
Ctrl+`	Changes between displaying cell values or formulas in the worksheet.
Ctrl+'	Copies a formula from the cell above.
Ctrl+Shift+"	Copies value from cell above.
Ctrl+-	Deletes the selected column or row.
Ctrl+Shift+=	Inserts a new column or row.
Ctrl+Shift+~	Switches between showing Excel formulas or their values in cells.
Ctrl+Shift+@	Applies time formatting.

Ctrl+Shift+!	Applies comma formatting.
Ctrl+Shift+$	Applies currency formatting.
Ctrl+Shift+#	Applies date formatting.
Ctrl+Shift+%	Applies percentage formatting.
Ctrl+Shift+^	Applies exponential formatting.
Ctrl+Shift+*	Selects the current region around the active cell.
Ctrl+Shift+&	Places border around selected cells.
Ctrl+Shift+_	Removes a border.
Ctrl++	Insert.
Ctrl+-	Delete.
Ctrl+Shift+(	Unhide rows.
Ctrl+Shift+)	Unhide columns.
Ctrl+/	Selects the array containing the active cell.
Ctrl+	Selects the cells that have a static value or don't match the formula in the active cell.
Ctrl+[	Selects all cells referenced by formulas in the highlighted section.
Ctrl+]	Selects cells that contain formulas that reference the active cell.
Ctrl+Shift+{	Selects all cells directly or indirectly referenced by formulas in the highlighted section.
Ctrl+Shift+}	Selects cells which contain formulas that directly or indirectly reference the active cell.
Ctrl+Shift+| (pipe)	Selects the cells within a column that don't match the formula or

	static value in the active cell.
Ctrl+Enter	Fills the selected cells with the current entry.
Ctrl+Spacebar	Selects the entire column.
Ctrl+Shift+Spacebar	Selects the entire worksheet.
Ctrl+Home	Move to cell A1.
Ctrl+End	Move to last cell on worksheet.
Ctrl+Tab	Move between Two or more open Excel files.
Ctrl+Shift+Tab	Activates the previous workbook.
Ctrl+Shift+A	Inserts argument names into a formula.
Ctrl+Shift+F	Opens the drop-down menu for fonts.
Ctrl+Shift+O	Selects all of the cells that contain comments.
Ctrl+Shift+P	Opens the drop-down menu for point size.
Shift+Insert	Pastes what is stored on the clipboard.
Shift+Page Up	In a single column, highlights all cells above that are selected.
Shift+Page Down	In a single column, highlights all cells above that are selected.
Shift+Home	Highlights all text to the left of the cursor.
Shift+End	Highlights all text to the right of the cursor.
Shift+Up Arrow	Extends the highlighted area up one cell.
Shift+Down Arrow	Extends the highlighted area down one cell.
Shift+Left Arrow	Extends the highlighted area left one character.
Shift +Right Arrow	Extends the highlighted area right one character.
Alt+Tab	Cycles through applications.

Alt+Spacebar	Opens the system menu.
Alt+Backspace	Undo.
Alt+Enter	While typing text in a cell, pressing Alt+Enter moves to the next line, allowing for multiple lines of text in one cell.
Alt+=	Creates a formula to sum all of the above cells.
Alt+'	Allows formatting on a dialog box.
F1	Opens the help menu.
F2	Edits the selected cell.
F3	After a name is created, F3 will paste names.
F4	Repeats last action. For example, if you changed the color of text in another cell, pressing F4 will change the text in cell to the same color.
F5	Goes to a specific cell. For example, C6.
F6	Move to the next pane.
F7	Spell check selected text or document.
F8	Enters Extend Mode.
F9	Recalculates every workbook.
F10	Activates the menu bar.
F11	Creates a chart from selected data.
F12	Save As option.
Shift+F1	Opens the "What's This?" window.
Shift+F2	Allows the user to edit a cell comment.

Shift+F3	Opens the Excel formula window.
Shift+F5	Brings up a search box.
Shift+F6	Move to previous pane.
Shift+F8	Add to selection.
Shift+F9	Performs calculate function on active sheet.
Ctrl+F3	Open Excel Name Manager.
Ctrl+F4	Closes current Window.
Ctrl+F5	Restores window size.
Ctrl+F6	Next workbook.
Ctrl+Shift+F6	Previous workbook.
Ctrl+F7	Moves the window.
Ctrl+F8	Resizes the window.
Ctrl+F9	Minimize current window.
Ctrl+F10	Maximize currently selected window.
Ctrl+F11	Inserts a macro sheet.
Ctrl+F12	Opens a file.
Ctrl+Shift+F3	Creates names by using those of either row or column labels.
Ctrl+Shift+F6	Moves to the previous worksheet window.
Ctrl+Shift+F12	Prints the current worksheet.
Alt+F1	Inserts a chart.
Alt+F2	Save As option.
Alt+F4	Exits Excel.

Alt+F8	Opens the macro dialog box.
Alt+F11	Opens the Visual Basic editor.
Alt+Shift+F1	Creates a new worksheet.
Alt+Shift+F2	Saves the current worksheet.

POWER POINT:

Shortcut keys	Description
Alt + W	View Tab
Alt + G	Design Tab
Alt + R	Review Tab
Alt + Q	Search
Ctrl + F5	Restore window to previous Size
Shift + F10	Display context menu
Shift + F6	Move anticlockwise among Pane
Ctrl + Shift + Z	Normal/Plain Text
Shift + F3	Toggle cases
Ctrl + Shift + F	Change Font Style
Ctrl + D	Duplicate slide
Alt + F10	Maximize window
Alt + N, W	Insert word art
Alt + N, X	Insert textbox
Alt + W, Q	Change the zoom
Alt + H, F and S	Change the font Size
Alt + H, S and H	Insert a shape
Alt + G, H	Select a theme
Alt + H, L	Select a slide layout
Alt + N, P	Insert a picture

Alt + H	Home Tab
Alt + N	Insert tab
Alt + S, B	Start Slideshow
Alt + F, X	Close PowerPoint
Esc	End the slideshow
Alt + T	Transitions Tab
Alt + A	Animation Tab
F5	Slide Show

Definitions and terminologies

Application: An application is a set of codes designed to allow specific tasks to happen. Microsoft Windows and Internet Explorer are common examples.

Access time: The performance of a hard drive or other storage device - how long it takes to locate a file.

Active program or window: The application or window at the front (foreground) on the monitor.

ALGOL: It was the first language with a formal grammar. ALGOL was created by a committee for scientific use in 1958. Its major contribution is being the root of the tree that has led to such languages as Pascal, C, C+ + and Java.

Algorithm: In computing, an algorithm is a procedure for accomplishing some tasks which, given an initial state, will terminate in a defined end-state.

ASCII (pronounced ask key): American Standard Code for Information Interchange. a commonly used data format for exchanging information between computers or programs.

Amplifier: A device that takes in a weak electric signal and sends out a strong one. It is used to boost electrical Signals in many electronic devices such as radios, !elevisions and telephone.

Analog Computer: A computer that operates on data which is in the form of continuous variable physical quantities.

Android: It is a linux based operating system designed Primarily for touchscreen mobile devices such as smartphones and tablets computer.

Antivirus Software: Antivirus software consists of 3omputer programs that attempt to identify threat and eliminate computer virus and other malicious software (Malware)

API: API refers to Application Programming Interface. It's the platform used by a program to access different services on the computer system.

Basics of computers and computer Applications for SSC & Railway Exams

Application Software: Application software is a subclass of computer software that employs the capabilities of a computer directly to a task that the user wishes to perform. e.g., word document, spreadsheet, etc.

Archieve: It provides backup storage.

Arithmetic Logic Unit (ALU): The arithmetic logic unit is a part of the execution unit, a core component of all CPUs. ALUs are capable of calculating the results of a wide variety of basic arithmetical and logical computations

Artificial Intelligence: Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today.

Array: An array is similar data saved on a computer system in a sequential form.

Assembler: A program that translates mnemonic statement into executable instruction.

Attribute: The characteristics of an entity are called its attributes.

BIOS: BIOS stands for Basic Input/Output System. It gives the computer a platform to run the software using a floppy disk or a hard disk. BIOS is responsible for booting a PC.

Bit: Bit is Binary Digit. It refers to a digit number, either a 0 or a 1. The binary digit is used to represent computerized data.

Backup: A copy of a file or disk you make for archiving purposes.

Backspace: Backspace key is used on the keyboard to delete the text. Backspace will delete the text to the left of cursor.

Bandwidth: The maximum amount of data that can travel in a communication path in a given time, measured in bits per second (bps).

Bar Code: A bar code is a machine-readable representation of information in a visual format on a surface. The first bar code system was developed by Norman Joseph Woodland and Bernard Silver in 1952.

Bitmap: A method of storing a graphic image as a set of bits in a computer memory. To display the image on the screen, the computer converts the bits into pixels.

Blog: It is a discussion or informational site published on the world wide web.

Bomb: A type of virus designed to activate at a specific date and time on your computer.

Bluetooth: A protocol that permits a wireless exchange of information between computers. cell phone and other electronic devices within a radius about 30 feet,

Booting: Booting is a bootstrapping process which starts the operating system when a computer is switched on

Botnet: It is a collection of internet connected programs communicating with other similar programs in order to perform tasks.

Boot Sequence: A boot sequence is the set of operations the computer performs when it is switched on which loads an operating system.

Browser: A special software that enables users to read/view web pages and jump from one web page to another.

Buffering: The process of storing data in a memory device, allowing the devices to change the data rates,perform error checking and error retransmission.

Bug: A software bug is an error, flaw, failure, or fault in a computer program or system that produces an incorrect or unexpected result.

Boolean: An expression, the value of which is either true or false.

BUS: A bus is a set of wires that enables flow of data from one location of the computer to another.

Byte: Eight bits is equal to 1 byte.

CGI: CGI stands for Common Gateway Interface. It defines how an auxiliary program and a Web server would communicate.

Class: A group of objects having same operations and attributes is defined as a class.

Client: A client is a program that asks for information from other processes or programs. Outlook Express is a great example of a client.

CD-ROM: An acronym for Compact Disc Read-Only Memory.

Client – Server: A common form of distributed system in which software is split between server tasks and client tasks. A client sends requests to a server, according to some protocol, asking for information or action, and the server responds.

Clipboard - A portion of memory where the Mac temporarily stores information. Called a Copy Buffer in many PC applications because it is used to hold information which is to be moved, as in word processing where text is "cut" and then "pasted".

Clock Rate (MHz) - The instruction processing speed of a computer measured in millions of cycles per second (i.e., 200 MHz).

Compiler - a program the converts programming code into a form that can be used by a computer.

Compression - a technique that reduces the size of a saved file by elimination or encoding redundancies (i.e., JPEG, MPEG, LZW, etc.)

Basics of computers and computer Applications for SSC & Railway Exams

CPU: The Central Processing Unit. The processing chip that is the "brains" of a computer.

Cache Memory: The speed of CPU is extremely high compared to the access time of main memory Therefore, the performance of CPU decreases due to the slow speed of main memory. To decrease the mismatch in operating speed, a small memory chip is attached between CPU and main memory whose access time is very close to the processing speed of CPU It is called the Cache Memory.

Chip: A tiny wafer of silicon containing miniature electric circuits that can store millions of bits of information.

Client-Server: Client-server is a network architecture which separates the client from the server. Each instance of the client software can send requests to a server or application server.

Cookie: A packet of information that travels between a browser and the web server

Compiler: A compiler is a computer program that -translates a series of instructions written in one computer language (called the source language) into another computer language (also called the object or target language).

Communication: The transrnission of data from one computer to another or from one device to another is called communication.

Computer Networks: A computer network is a system or communication among two or more computers. The computer networks can be broadly classified as Homogenous' and 'Heterogeneous'.

Computer Graphics: Computer Graphics are visual presentations on a computer screen. Examples are photographs, drawings, line arts, graphs, diagrams, typography numbers, symbols, geometric designs, maps, engineering drawings or other images.

Cold Boot: When a computer restarts after the power cut is called cold boot

Control Panel: Control Panel is the part of Windows menu. accessible from the start menu, which allows users to view and manipulate basic system settings and controls, such as adding hardware. adding/removing software, controlling user accounts, changing accessibility options, etc.

Control Unit: A control unit is the part of a CPU that 'erects its operation. The outputs of this unit control The activity of the rest of the device.

Cracker: The preferred term used to refer to a computer criminal who penetrates a computer to steal information or damage the program in some way

Crash - a system malfunction in which the computer stops working and has to be restarted.

Cursor - The pointer, usually arrow or cross shaped, which is controlled by the mouse.

CMOS: CMOS is an abbreviation for Complementary Metal-Oxide-Semiconductor. It is the battery powered chip that is situated on the Motherboard that retains system information such as date and time.

Basics of computers and computer Applications for SSC & Railway Exams

Data: Data refers to the information that is saved on a computer.

DOS: DOS is an acronym for Disc Operating System. It is a command line operating system launched by Bill Gates.

Database - an electronic list of information that can be sorted and/or searched.

Defragment - (also - optimize) to concatenate fragments of data into contiguous blocks in memory or on a hard drive.

Dialog box - an on-screen message box that appears when the computer requires additional information before completing a command.

Digitise - To convert linear, or analogue, data into digital data that can be used by the computer.

Disk - a spinning platter made of magnetic or optically etched material on which data can be stored.

Disk drive: The machinery that writes the data from a disk and/or writes data to a disk.

Disk window: The window that displays the contents or directory of a disk.

Document - a file you create, as opposed to the application which created it.

DOS - acronym for Disk Operating System - used in IBM PCs.

Download - to transfer data from one computer to another. (If you are on the receiving end, you are downloading. If you are on the sending end, you are uploading).

Drag - to move the mouse while its button is being depressed.

Driver - a file on a computer that tells it how to communicate with an add-on piece of equipment (like a printer).

DTP: Desk Top Publisher (ing) is a term that describes a program that enables users to create, design, and print items such as business cards, birthday cards, letterheads, calendars, invitations, and so on.

Editing: The process of changing information by inserting, deleting, replacing, rearranging and reformation.

E-mail: Electronic mail, abbreviated e-mail is a method of composing, sending, storing and receiving messages over electronic communication systems.

Encapsulation: It is a mechanism that associates the code and the data it manipulates into a single unit and keeps them safe from external interference.

Encryption: In cryptography, encryption is the process of encoding messages (or information) in such a way that hackers cannot read it, but the authorised users can access it.

End User: Any individual who uses the information oefierated by a computer based system.

Basics of computers and computer Applications for SSC & Railway Exams

Entity: An entity is something that has certain attributes or properties which may be assigned values.

Entity-relationship diagram: It's a diagram that represents entities and how they are related to each other.

Ethernet - a protocol for fast communication and file transfer across a network.

Execution Time: The total time required to executela program on a particular system.

Expansion slot: A connector inside the computer that allows one to plug in a printed circuit board that provides new or enhanced features.

Environment: Environment refers to the interaction among all factors external to a physical platform. An environment is made of specific software, hardware, and network protocols that allow communication with the system.

FAT: FAT is an acronym for File Allocation Table. It resembles a table of contents so that files can be located on a computer.

Fault: Hardware or software failure.

Fax: It stands for 'Facsimile machine'. It is used to transmit a copy of a document electronically.

Field: The attributes of an entity are written as fields in the table representation.

File - the generic word for an application, document, control panel or other computer data.

Floppy - a 3.5-inch square rigid disk which holds data. (so named for the earlier 5.25 and 8 inch disks that were flexible).

Folder - an electronic subdirectory that contains files.

Font - a typeface that contains the characters of an alphabet or some other letterforms.

Fragmentation - The breaking up of a file into many separate locations in memory or on a disk.

Freeze - a system error, which causes the cursor to lock in place

Front End: It is an interface through which a program can be accessed by common users.

Gateway: A device that is used to joint together two networks having different base protocols.

Groupware: It is software that allows networked individual to form groups and collaborate on documents, programs or database.

Hardware: Hardware is a set of physical objects such as monitor, keyboard, mouse, and so on.

Hard drive - a large capacity storage device made of multiple disks housed in a rigid case.

Head crash - a hard disk crash caused by the heads coming in contact with the spinning disk(s).

High density disk: a 1.4 MB floppy disk.

Hub: A network device that connects multiple computers on a LAN, so that they can communicate with one another.

Hyperlink: An image or portion of text on a web page that is linked to another web page.

Highlight: To select by clicking once on an icon or by highlighting text in a document.

Hit rate - The fraction of all memory reads which are satisfied from the cache.

Hz - Abbreviation for hertz, the number of cycles per second, used to measure clock speed

Icon: Icon is a small visual display of an application which can be activated by clicking on it.

IDE: It stands for Integrated Development Environment. IDE is a programming system that combines several tools of programming to provide an integrated platform for programming. For instance, Visual Basic provides an IDE.

Initialise - to format a disk for use in the computer; creates a new directory and arranges the tracks for the recording of data.

Insertion point - in word processing, the short flashing marker that indicates where your next typing will begin.

Installer - software used to install a program on your hard drive.

Interrupt button - a tool used by programmers to enter the debugging mode. The button is usually next to the reset button

Instance: It is an object described by its class.

Internet: Internet is a network that accommodates several computers to facilitate exchange and transfer of data.

Joystick: A joystick is a computer peripheral or general control device consisting of a handheld stick that pivots about one end and transmits its angle in two or three dimensions to a computer.

Kernel: It is a program called when a computer system is started. Kernel is responsible for setting up system calls in order to manage hardware and system services, and allocate resources to applications.

Kilobyte - 1024 bytes.

LIGHT Pen: A light sensitive style for forming graphics by touching coordinates on a display screen. There by seeming to draw directly on the screen.

Loop: A sequence of instructions that is executed repeatedly until a terminal condition occurs.

LAN: LAN is an acronym for Local Area Network that spans small area. A LAN can be connected to another LAN to accommodate more computers.

Landscape: In printing from a computer, to print sideways on the page.

Launch - start an application.

Memory: Memory is the internal storage location where data and information is stored on a computer.

Modem: Modem is a term created from the beginning letters of two other words viz. MOdulation and DEModulation. The term implies changing of data from digital to analog and then back to digital.

Morphing: The transformation of one image into another image

Multitasking: Multitasking can simultaneously work with several programs or interrelated tasks that share memories, codes, buffers and files.

Multithreading: It is a facility available in an operating system that allows multiple functions from the same application packages.

Multiuser: The term describing the capability of a computer system to be operated at more than one terminal at the same llf 11°

Multiplexer: It is a device That combines multiple input signals into an aggregate signal for transmission.

Memory - the temporary holding area where data is stored while it is being used or changed; the amount of RAM a computer has installed.

Menu - a list of program commands listed by topic.

Menu bar: The horizontal bar across the top of the screen that lists the menus.

MHz - Abbreviation for megahertz, or millions of cycles per second.

Multi-tasking: Running more than one application in memory at the same time.

Nibble: A sequence of four adjacent bits , or a half byte . A hexadecimal or BCD coded digit can be represented by a nibble .

Network: A Network is a group of computers connected to each other in order to send and receive data.

Operating System: An Operating System provides the software platform required for various applications to run on. Its responsibility is to manage memory storage and security of Data.

Optical disk: A high-capacity storage medium that is read by a laser light.

Packet: Sections in which message or data are divided to transfer it over a network.

Pixel: Pixel is formed by combining the two words viz. Picture Element. It represents one point within an image.

Palette - a small floating window that contains tools used in a given application.

Partition - a subdivision of a hard drives surface that is defined and used as a separate drive.

Paste: To insert text, or other material, from the clipboard or copy buffer.

PC - acronym for personal computer commonly used to refer to an IBM or IBM clone computer that uses DOS.

PCI: Acronym for Peripheral Component Interchange - the newer, faster bus architecture.

Peripheral - an add-on component to your computer.

Pop-up menu: Any menu that does not appear at the top of the screen in the menu bar. (May pop up or down)

Power PC - a processing chip designed by Apple, IBM and Motorola (RISC based).

Power Mac - a family of Macs built around the PowerPC chip.

Print spooler - a program that stores documents to be printed on the hard drive, thereby freeing the memory up and allowing other functions to be performed while printing goes on in the background.

Port: Port is a connecting component mainly a hardware that enables two computers to allow data sharing physically. Examples are USB and HDMI.

Process: It's a series of commands that changes data values.

Protocol: Protocol refers to a set of rules that are followed by two devices while interacting with each other.

Query: Query is a request made by a computer from a database residing in the same system or a remotely located system.

RAM: RAM is an acronym for Random Access Memory. It is a configuration of storage cells that hold data so that it can be processed by the central processing unit. RAM is a temporary storage location.

Router: A network device that enables the network to reroute messages it receives that are intended for other networks. The network with the router receives the message and sends it on its way exactly as received. In normal operations. they do not store any of the messages that they pass through.

Routing: The process of choosing the best path throughout the LAN.

Root directory - the main hard drive window.

ROM: ROM is an acronym for Read-Only Memory. It is semiconductor-based storage system that saves information permanently.

Software: Software is a program (coding) that the computer reads. The system then carries out functions as directed by the code. Adobe Photoshop is software.

Save - to write a file onto a disk.

Save as: To save a previously saved file in a new location and/or with a new name.

Scroll: To shift the contents of a window to bring hidden items into view.

Swapping: Storing programs on disk and then transferring these programs into main storage as and when they are needed.

Synchronisation: This method ensures that the receiving end can recognise characters in order, in which the transmitting end sends them in a serial data transmission.

Scroll bar - a bar at the bottom or right side of a window that contains the scroll box and allows scrolling.

Scroll box - the box in a scroll bar that is used to navigate through a window.

SCSI: Acronym for Small Computer System Interface.

Serial port: A port that allows data to be transmitted in a series (one after the other), such as the printer and modem ports on a Mac.

Server - a central computer dedicated to sending and receiving data from other computers (on a network).

Shut down - the command from the Special menu that shuts down the computer safely.

Spreadsheet - a program designed to look like an electronic ledger.

Startup disk - the disk containing system software and is designated to be used to start the computer.

Surge suppressor - a power strip that has circuits designed to reduce the effects of surge in electrical power. (Not the same as a UPS)

TCP/IP: TCP/IP is an acronym for Transmission Control Protocol/Internet Protocol. It's a set of communication protocols used to connect host computers on the Internet.

Title bar - the horizontal bar at the top of a window that has the name of the file or folder it represents.

URL: URL stands for Universal Resource Locator. It's a way of accessing the Internet.

Upload - to send a file from one computer to another through a network.

Basics of computers and computer Applications for SSC & Railway Exams

Uninterruptible Power Source (UPS): A constantly charging battery pack that powers the computer. A UPS should have enough charge to power your computer for several minutes in the event of a total power failure, giving you time to save your work and safely shut down.

UPS - acronym for Uninterruptible Power Source.

Virtual Memory: Virtual Memory is the unused memory on the hard disk used when certain applications require more RAM than is available on the machine.

Virus: Virus is a program that is loaded onto your computer without you knowing about it and it runs to hinder the normal functioning of the computer.

WWW: WWW stands for World Wide Web. It's a term used to define the Internet.

WAN: WAN is an acronym for Wide Area Network. Such a network spans over an area larger than a LAN.

WORM - acronym for Write Once-Read Many; an optical disk that can only be written to once (like a CD-ROM).

Zoom box - a small square in the upper right corner of a window which, when clicked, will expand the window to fill the whole screen.

ZIP: ZIP is an acronym for Zone Information Protocol. ZIP application enables transfer of data using compression of files.

EXTENSION

Audio file formats by file extensions	**Compressed file extensions**
.aif - AIF audio file	.7z - 7-Zip compressed file
.cda - CD audio track file	.arj - ARJ compressed file
.mid or .midi - MIDI audio file.	.deb - Debian software package file
.mp3 - MP3 audio file	.pkg - Package file
.mpa - MPEG-2 audio file	.rar - RAR file
.ogg - Ogg Vorbis audio file	.rpm - Red Hat Package Manager
.wav - WAV file	.tar.gz - Tarball compressed file
.wma - WMA audio file	.z - Z compressed file
.wpl - Windows Media Player playlist	.zip - Zip compressed file
Disc and media file extensions	**Data and database file extensions**
.bin - Binary disc image	.csv - Comma separated value file
.dmg - macOS X disk image	.dat - Data file

.iso - ISO disc image .toast - Toast disc image .vcd - Virtual CD	.db or .dbf - Database file .log - Log file .mdb - Microsoft Access database file .sav - Save file (e.g., game save file) .sql - SQL database file .tar - Linux / Unix tarball file archive .xml - XML file
Executable file extensions .apk - Android package file .bat - Batch file .bin - Binary file .cgi or .pl - Perl script file .com - MS-DOS command file .exe - Executable file .gadget - Windows gadget .jar - Java Archive file .py - Python file .wsf - Windows Script File	**Font file extensions** .fnt - Windows font file .fon - Generic font file .otf - Open type font file .ttf - TrueType font file
Image file formats by file extension .ai - Adobe Illustrator file .bmp - Bitmap image .gif - GIF image .ico - Icon file .jpeg or .jpg - JPEG image .png - PNG image .ps - PostScript file .psd - PSD image .svg - Scalable Vector Graphics file .tif or .tiff - TIFF image	**Internet related file extensions** .asp and .aspx - Active Server Page file .cer - Internet security certificate .cfm - ColdFusion Markup file .cgi or .pl - Perl script file .css - Cascading Style Sheet file .htm and .html - HTML file .js - JavaScript file .jsp - Java Server Page file .part - Partially downloaded file .php - PHP file .py - Python file

	.rss - RSS file .xhtml - XHTML file
Presentation file formats by file extension .key - Keynote presentation .odp - OpenOffice Impress presentation file .pps - PowerPoint slide show .ppt - PowerPoint presentation .pptx - PowerPoint Open XML presentation	**Programming files by file extensions** .c - C and C++ source code file .class - Java class file .cpp - C++ source code file .cs - Visual C# source code file .h - C, C++, and Objective-C header file .java - Java Source code file .sh - Bash shell script .swift - Swift source code file .vb - Visual Basic file
Spreadsheet file formats by file extension .ods - OpenOffice Calc spreadsheet file .xlr - Microsoft Works spreadsheet file .xls - Microsoft Excel file .xlsx - Microsoft Excel Open XML spreadsheet file	**System related file formats and file extensions** .bak - Backup file .cab - Windows Cabinet file .cfg - Configuration file .cpl - Windows Control panel file .cur - Windows cursor file .dll - DLL file .dmp - Dump file .drv - Device driver file .icns - macOS X icon resource file .ico - Icon file .ini - Initialization file .lnk - Windows shortcut file .msi - Windows installer package .sys - Windows system file .tmp - Temporary file

Video file formats by file extension	Word processor and text file formats by file extension
.3g2 - 3GPP2 multimedia file	.doc and .docx - Microsoft Word file
.3gp - 3GPP multimedia file	.odt - OpenOffice Writer document file
.avi - AVI file	.pdf - PDF file
.flv - Adobe Flash file	.rtf - Rich Text Format
.h264 - H.264 video file	.tex - A LaTeX document file
.m4v - Apple MP4 video file	.txt - Plain text file
.mkv - Matroska Multimedia Container	.wks and .wps- Microsoft Works file
.mov - Apple QuickTime movie file	.wpd - WordPerfect document
.mp4 - MPEG4 video file	
.mpg or .mpeg - MPEG video file	
.rm - RealMedia file	
.swf - Shockwave flash file	
.vob - DVD Video Object	
.wmv - Windows Media Video file	

Abbreviations

A	B
Al – Artificial intelligence	BINAC - Binary Automatic Computer
ALGOL – Algorithmic Language	BCC – Blind Carbon Copy
ARP – Address resolution Protocol	Bin – Binary
ASP- Active Server Pages	BASIC - Beginner's All-purpose Symbolic
ASCII – American Standard Code for	Instruction Code
Information Interchange	BIOS – Basic Input Output System
AMR - Adaptive Multi-Rate Codec	BCD - Binary Coded Decimal
AAC - Advanced Audio Coding	BHTML - Broadcast Hyper Text Markup
ATA – Advanced Technology Attachment	Language
ABR – Average Bit rate	BIU - Bus Interface Unit
AMOLED – Active-Matrix Organic Light-	BMP – Bitmap

Basics of computers and computer Applications for SSC & Railway Exams

Emitting Diode AMD – Advanced Micro Devices AVI – Audio Video Interleaved ATM – Asynchronous Transfer Mode ANSI - American National Standard Institute ARPANET- Advanced Research Projects Agency Network ADSL -Asymmetric Digital Subscriber Line API -Application Program Interface ACID- Atomicity Consistency Isolation Durability	BPS - Bytes Per Second BBP – Base band Processor BPM – Business Process Modeling BGP - Border Gateway Protocol BIPS - Billion Instruction Per Second BCR - Bar Code Reader BRD - Blu Ray Disc
C CAD - Computer Aided Design CC – Carbon Copy COBOL – Common Business Oriented Language CD – Compact Disc CRT – Cathode Ray Tube CDR – Compact Disc Recordable CDROM – Compact Disc Read Only Memory CDRW – Compact Disc Rewritable CDR/W – Compact Disk Read/Write CUI - Character User Interface CDMA- Code Division Multiple Access CAN - Campus Area Network CNM- Circulatory Network Mode	**D** DBA – Data Base Administrator DBMS – Data Base Management System DNS – Domain Name System DPI – Dots Per Inch DRAM – Dynamic Random Access Memory DVD – Digital Video Disc/Digital Versatile Disc DVDR – DVD Recordable DVDROM – DVD Read Only Memory DVDRW – DVD Rewritable DVR – Digital Video Recorder DOS – Disk Operating System DHCP - Dynamic Host Configuration Protocol DSL- Digital Subscriber Line DHTML Dynamic Hyper Text Markup Language
E EBCDIC – Extended Binary Coded Decimal	**F** FAX - Far Away Xerox/ facsimile

Interchange Code e-Commerce – Electronic Commerce EDP – Electronic Data Processing EEPROM – Electrically Erasable Programmable Read Only Memory ELM/e-Mail – Electronic Mail ENIAC - Electronic Numerical Integrator and Computer EOF - End Of File EPROM - Erasable Programmable Read Only Memory EDI - Electronic Data Interchange	FDC - Floppy Disk Controller FDD - Floppy Disk Drive FORTRAN - Formula Translation FS - File System FTP - File Transfer Protocol FIFO - First In First Out FAT - File Allocation Table
G GPRS - General Packet Radio Service GPS - Global Positioning System GUI - Graphical User Interface Gb - Gigabit GB - Gigabyte GIF - Graphics Interchange Format GSM - Global System for Mobile Communication GIGO - Garbage in Garbage Out	**H** HDD - Hard Disk Drive HP - Hewlett Packard HTML - Hyper Text Markup Language HTTP - Hyper Text Transfer Protocol HTTPS - Hyper Text Transfer Protocol Secure HDMI - High Definition Multimedia Interface HDTV - High Definition Television HVD- Holographic Versatile Disc
I INTEL - Integrated Electronics IP - Internet Protocol. ISP - Internet Service Provider. IMAP- Internet Message Access Protocol IVR- Interactive Voice Response ICANN - Internet Corporation of Assign Names & Numbers	**J** JAD - Java Application Descriptor JPEG - Joint Photographic Expert Group

ISDN - Integrated Servers Digital Network ISO- International Standard Organization/ International Org for Standardization	
K Kb - Kilobit KB - Kilobyte KHz - Kilohertz Kbps - Kilobit Per Second	**L** LED - Light Emitting Diode LCD – Liquid Crystal Display LIFO- Last In First Out
M Mb – Megabit MB – Megabyte MPEG – Moving Picture Experts Group MMS – Multimedia Message Service MICR – Magnetic Ink Character reader MIPS – Million Instructions Per Second MIME - Multipurpose Internet Mail Extension MIDI - Musical Instrument Digital Interface MANET - Mobile Ad-Hoc Network MAC- Media Access Control MODEM- Modulator Demodulator	**N** NAT - Network Address Translation NIC – Network Interface Card NOS – Network Operating System NTP - Network Time Protocol
O OMR – Optical Mark Reader OOP – Object Oriented Programming OSS – Open Source Software OCR -Optical Character Reader / Recognition	**P** P2P - Peer-to-peer PDA - Personal digital assistant. PDF - Portable Document Format PNG - Portable Network Graphics POS – Point Of Sale PPP – Point-to-Point Protocol PROM – Programmable Read Only Memory

	PSTN – Public Switched Telephone Network PING – Packet Internet Gopher PAN- Personal Area Network PCB -Printer Circuit Board PCB - Printer Circuit Board
R RAM – Random Access Memory ROM -Read Only Memory RDBMS – Relational Data Base Management System RIP – Routing Information Protocol RTF – Rich Text Format RARP - Reverse Address Resolution Protocol	**S** SMTP – Simple Mail Transfer Protocol SQL – Structured Query Language SRAM – Static Random Access Memory SNMP – Simple Network Management Protocol SIM – Subscriber Identification Module SMPS - Switch Mode Power Supply SFTP Secure File Transfer Protocol SSH - Secure Shell SIP - Session Initiation Protocol SAN -Storage Area Network
T TCP – Transmission Control Protocol TB – Tera Bytes TFTP --Trivial File Transfer Protocol Tel Net - Telecommunication Networking TIPS -Trillion Instruction Per Second	**U** UPS – Uninterrupted Power Supply URI – Uniform Resource Identifier URL – Uniform Resource Locator USB - Universal Serial Bus ULSI - Ultra Large Scale Integration UNIVAC - Universal Automatic Computer UMTS - Universal Mobile Telecommunication System. UDP -User Datagram Protocol

V	W
VIRUS - Vital Information Resource Under Seized VOIP - Voice Over Internet Protocol VAR – Variable VGA – Video Graphics Array VSNL – Videsh Sanchar Nigam Limited VDU – Visual Display Unit VAN - Value Added Network	WAIS - Wide-Area Information Server. Wi-Fi – Wireless Fidelity WLAN – Wireless Local Area Network WPA – Wi-Fi Protected Access WWW – World Wide Web WORM – Write Once Read Many WBMP - Wireless Bitmap Image WMA - Windows Media Audio WMV - Windows Media Video WIMAX- Worldwide Interoperability for Microwave Access
X	**Z**
XHTML – eXtensible Hypertext Markup Language XML - eXtensible Markup language	ZB – Zeta Byte

Fathers and Inventers of Computer Field

Invention	Inventors
The Analytical Engine	Charles Babbage
The Turing Machine	Alan Turing
Microprocessor	Faggin, Hoff&Mazor
Floppy Disk	Alan Shugart
Computer Mouse	Douglas Engelbart
Key board	Herman Hollerith
Transistor	John Bardeen, Walter Brattain & Wiliam Shockley
RAM	An Wang and Jay Forrester
Trackball	Tom Cranston and Fred Longstaff

Integrated Circuit	Jack Kilby & Robert Noyce
Laser printer	Gary Stark weather
Scanner	Rudolph Hell
CD-ROM	James Russell
C programming language	Dennis Ritchie
C++ programming language	Bjarne Stroustrup
PASCAL programming language	Niklaus Wirth
Java programming language	James Gosling
Perl programming language	Larry Wall
Python programming language	Guido van Rossum
The Z Series Computers	Konrad Zuse
First fully electronic digital computer-ABC computer	John Vincent Atanasoff & Clifford Berry

APPLICATIONS OF COMPUTER

Banking

- Banks are one of the busiest business organizations that have to perform faster and efficiently.
- Today all financial transactions are done by computer software. They provide security, speed, and convenience
- ATM machines which are completely automated are making it even easier for the customer to deal banking transactions. The computer software that Authenticates the user and dispenses cash

Insurance

- Today maximum insurance-related activities are done by computer software
- Insurance companies are maintaining a database of all clients with the following information
  1. Procedure to continue with policies
  2. Starting date of the policies
  3. Next due installment of a policy

4. Maturity date
5. Interests due

Defence

- The computer performs a very important role in defence.
- Software embedded in almost every weapon. Software is used for controlling the flight and targeting in ballistic missiles. Software is used to control access to atomic bombs
- Some military areas where a computer has been used are:

1. Missile Control
2. Military Communication
3. Military Operation and Planning
4. GPS tracking
5. Controlling of defence vehicles
6. Incoming missile protection

Education

- The computer helps in providing a lot of facilities in the modern education system.
- E-learning: It is easier to learn from e-learning software. It not only contains text also contains image and animation
- Quick communication between students, teachers and parents.
- In recent days, online classes have played an important role in education
- Teachers use computers to record grades, calculate the average, Manage attendance, and access data on student performance in online programs and assessments

Desktop publishing

- Desktop publishing is the creation of documents using page layout software on a personal computer. It was first used exclusively for print publications, but now it also assists in the creation of various forms of online content
- Examples of desktop publishing software: Adobe InDesign, Microsoft Publisher, QuarkXPress, and Scribus

Healthcare

- Computers have become an important part in the medical industry
- Computers are being used in hospitals to keep the record of patients and medicine. It is also used in scanning and diagnosing different diseases.

  Example: ECG, EEG, ultrasound and CT scan, etc.
- Some major fields of health care in which computers are used

1. Diagnostic System
2. Lab-diagnostic System
3. Patient Monitoring System
4. Pharma Information System
5. Surgery

Communication

- The computer performs a very important role in communication fields
- Some of the important applications are
  - E-mail
  - Video-conferencing
  - Telnet
  - FTP

Engineering Design

- Engineers use computers to create the design of a complex object using computer programs for computer-aided drafting
- Some of the fields are
  1. Structural Engineering
  2. Industrial Engineering
  3. Architectural Engineering

Entertainment

- The computer performs a very important role in modern-day cinema
- Most of the persons are using computer for entertainment purposes such as:
  1. watching movies
  2. listening songs
  3. playing games

Scientific Research

- Computers are playing an important role in scientific research activities.
- Computers are used in the following fields for scientific research

1. Space Research
2. Meteorological research
3. Military Research
4. Medical Research, etc.