Run with Goal...!

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Chapters Page No

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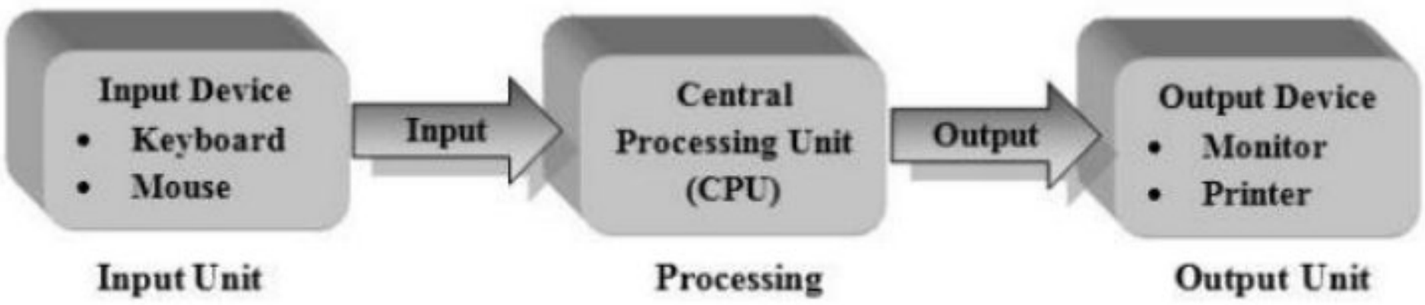
Chapter-1
OVERVIEW OF COMPUTER

Definition:

"Computer is an electronic machine that can store, recall and process data. It can perform tasks or complex calculation according to a set of instructions or programs.

How does the computer work?



Input-Process-Output cycle (IPO Cycle)

Characteristics of Computer:

- Speed
- Storage
- Accuracy
- Diligence
- Versatility
- Flexibility
- Cost effectiveness

Speed:-

The computer works very fast. The speed of Computer is measured in terms of MIPS (Million Instructions Per Second) or BIPS (Billion Instructions Per Second).

Example:- A money counting machine counts money faster than man.

Storage:-

The computer can store a large volume of data and information. The storage capacity of the computer is measured in terms of **Bytes**. A group of 8 Bits is called a Byte.

Accuracy:-

The computer generated results are exact and without any mistakes with high rate of consistency.

Diligence:-

Unlike human beings, a computer does not suffer from limitations like tiredness and lack of concentration. It can work for hours without making any errors.

Cost effectiveness:

Computers reduce the amount of paper work and human effort, thereby reducing costs.

Versatility:-

Computers are capable of performing any task. Multi-processing features of computer make it quite versatile in nature. The computer can be adapted to any field easily. It is used for scientific calculations, business processing, for playing games, teaching, training etc.

Flexibility:-

Flexibility would involve the number of things you can do with a computer. While some are best used for simple business tasks, and filing of tasks, others are good for multimedia, gaming, and soon.

Components of Computer system:

There are four components in the computer system. They are:

- Hardware
- Software
- Data & Information
- User(s)

Hardware

The physical parts of a computer system called as hardware. The hardware components can beseen, touch and feel. The hardware components are fixed inside or outside the computer system.

Example Keyboard, Mouse, Monitor, Printer, RAM, CPU etc.

Software:-

A Set or collection of programs is known as software. The software is a computer program written using some computer programming languages to operate the computer. Software tells the hardware what to do. Unlike hardware, we can't touch the software.

Example:- Operating System, TUX Paint, Office Packages, Nudi, Adobe Reader, Computer Games etc.

The software is broadly classified into two types. They are

1. **System Software:** It is a type of computer program that is designed to control and work with computer hardware, to run a computer's hardware and application programs. Example: Microsoft Windows, Linux, DOS etc.

2. **Application software:** It is a type of Software written by the user to perform a particular task like drawing a picture, playing computer games. Example: Paint, Nudi and Office Package etc.

Difference Between Hardware & software

Hardware	**Software**
Physical components of a computer are called Hardware.	Set of programs is called Software.
Hardware can touch, see and feel.	The software can not touch and feel.
Constructed using physical materials or components.	Developed by the programming language.
Not affected by computer viruses.	Affected by computer viruses.
User cannot make copies	User can make copies
Example: Monitor, Keyboard, RAM	Example: OS, Text Editor, Nudi

Data

Data is a collection of unprocessed items, which can include text, numbers, audio or video. Datais the raw information or basic facts that computer can process.

For Example: "PARAM" 16

The computer processed data is called information, which gives particular meaning.

For Example: Name="PARAM" Age=16.

User(s)
People who use the computers are called users. These computer operators are called computerusers.

Functional components of a computer:

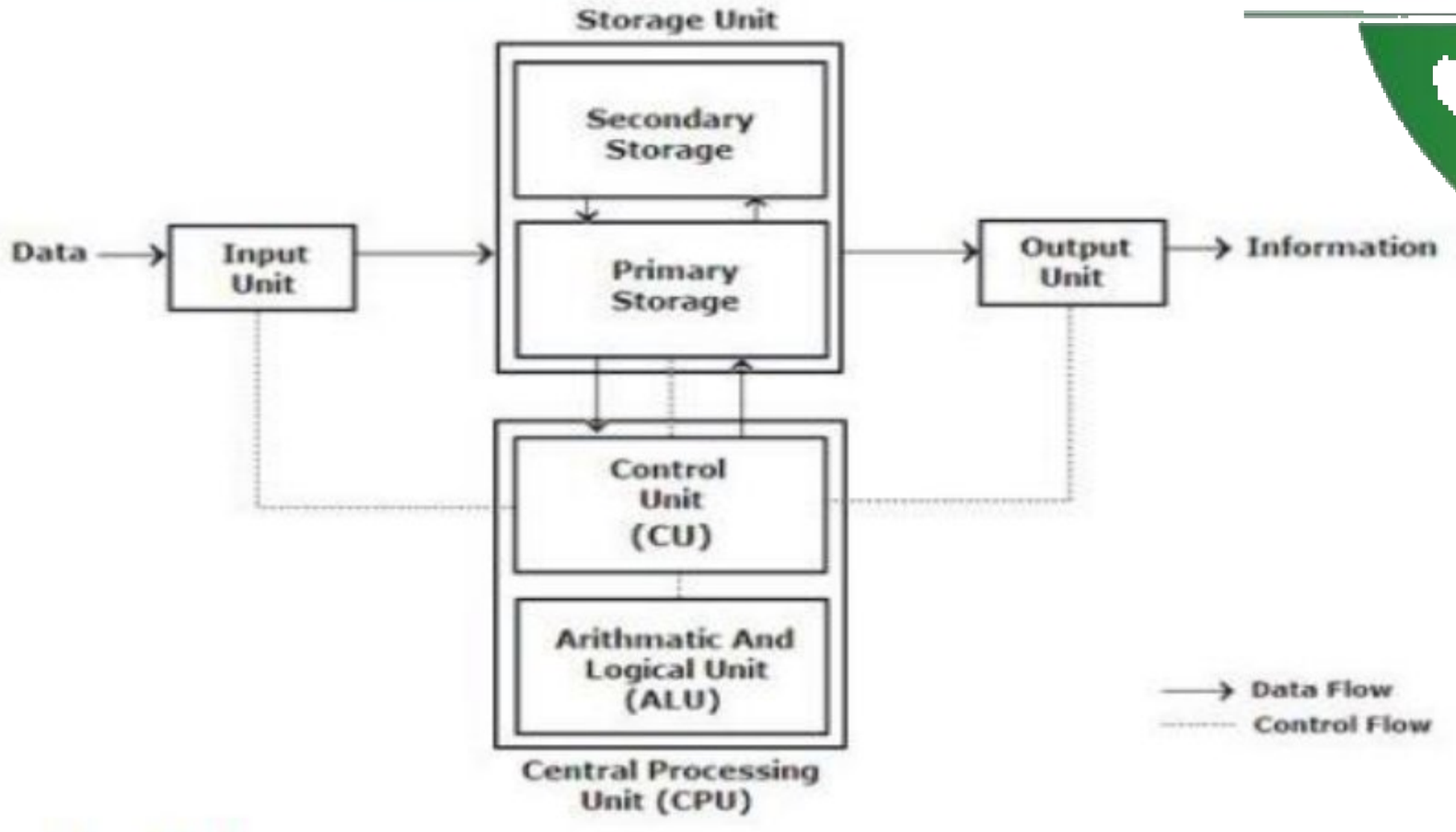
Basically any computer is supposed to carry out the following functions.

- Accepts the data and program as input.
- Stores the data, program and retrieve as and when required.
- Process the data as per instructions given by the program and convert it into usefulinformation.
- Communicate the information as output.

Block diagram of a computer

A computer is designed using four basic units. They are:

1.Input Unit
2. Central Processing Unit(CPU)
- Control Unit
- Arithmetic and Logic Unit (ALU)
3. Memory Unit
4.Output Unit



Input Unit

Computers need to receive data and instructions in order to solve a problem. The Input unit performs this operation. The Input Unit basically links the external world or environment to the computer system. The input unit may consist of one or more input devices. The Keyboard and mouse of a computer are the most commonly used input devices.

Input Devices:-

Key Board:-

- Christopher Shales gave a **QWERTY** Keypad Layout.
- It Includes 102 to 120 Key.
- Different keys are: Alphabetic Key, Numeric Key, Functional Key, Control Key & Arrow Key.
- Types of Keyboard are: Usual Keyboard, Multimedia Keyboard, Wireless Keyboard. Virtual Keyboard.

Mouse:- Mechanically Operated User Search Engine

- Douglas Engel Bart invited Mouse.
- It Includes 3 Buttons

Left Button:- Selects a file.
Right Button:-Use to View File Properties
Scroll Button:- Used to Move Up & Down.

- Types of Mouse's are Scroll Mouse, Wireless Mouse, Mechanical Mouse, USB Mouse.

Single Click :- Select's The File.
Double Click :- Executes the File.

Scanner:-

- The Quality of Scanner is Measured by DPI (Dot per Inch's)
- Types of Scanner:-

- OCR:- Optical Character Recognition is used to Grasp the Printed Text.
- OMR: Optical Mark Reader it is mainly used for Competitive exam paper Evaluation.
- MICR:-Magnetic Ink Character Recognition are used in Banks. In 1958 American Bankers Association used it For the First time.

Camera:-

- Used to capture the Still Pictures.
- The Quality of Camera's are measured through Mega Pixel.
- Different types of Camera's are Web Camera, Digital Camera, CCTV.

CCTV:-Closed Circuit Television Camera

Microphone:-

- It is Used to give the Voice mode information to Computer.

Light Pen:-

- It works on Bases on Principle of Optical.

Joystick is used for the Gaming Purpose.
Joysticks are often used to control video games, simulated programs, usually have one or more push-buttons whose state can also be read by the computer.

Central Processing Unit (CPU)

It is the main part of a computer system like the heart of a human being. Most computers are identified by the type of CPU that is present in them. The function of the CPU is to interpret the instructions in the program and execute them one by one. It consists of two major units.

Processor:-

The processor or CPU is the main component on the motherboard and is called the brain of the computer. The CPU consists of Arithmetic Logic Unit (ALU) and Control Unit (CU). CPU also has a set of registers which are temporary storage areas for holding data, and instructions.

Control Unit

It controls and directs the transfer of program instructions and data between various units. The main activity is to maintain order and direct the operations of the entire system.

Arithmetic and Logic Unit (ALU)

Arithmetic and Logic Unit performs arithmetic andlogical operations and controls the speed of these operations. Arithmetic operations like addition, subtraction, multiplication and division (+,-,*, /) and logical operations like AND, OR, NOT and relational operations like (<, >, <= ,>=) are being carried out in this unit.

Memory Unit

The data and the instructions required for processing have to be stored in the memory unit before the actual processing starts. In a similar manner, the results generated from processing have to be preserved before it is displayed. The memory units thus provide space to store input data, intermediate results and the final output generated.

Secondary storage devices are additional memory (storage) devices such as floppy disks, magnetic tapes, Hard Disk Drive (HDD), Compact Disk (CD), Digital Versatile Disk (DVD) etc., which are used to store huge information for future use.

Primary Storage Device

Random Access Memory – RAM

RAM (random access memory) is a computer's short-term memory, where the data that the processor is currently using is stored. computer can access RAM memory much faster than data on a hard disk, SSD, or other long-term storage device,

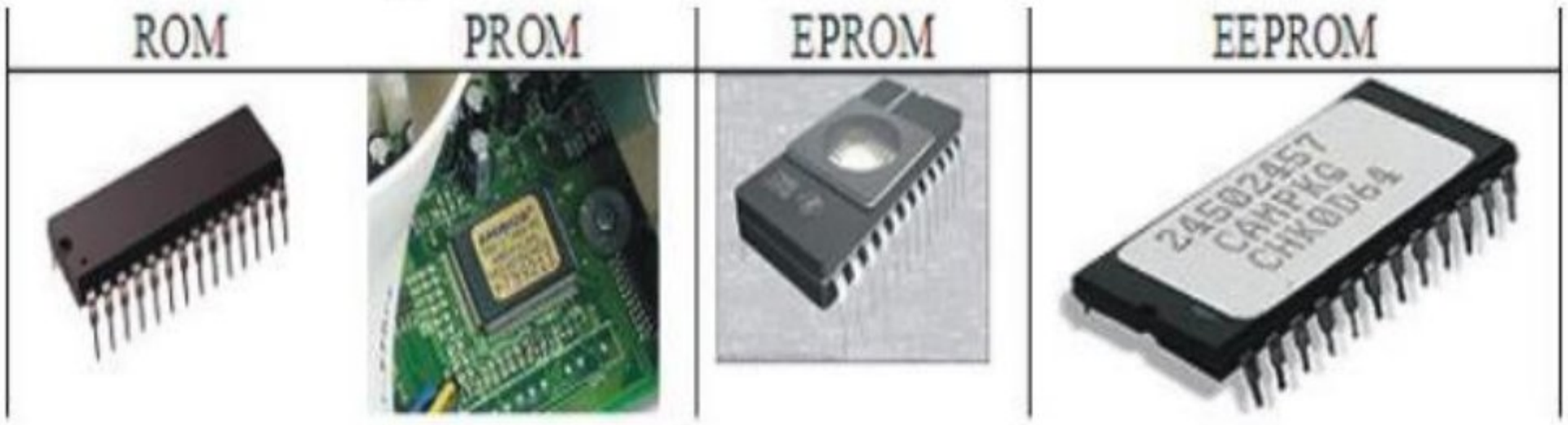
There Two types:

1. SRAM
2. DRAM

Cache memory is a smaller, faster memory which stores copies of the data from frequently used main memory locations. This is an extremely fast type of memory that acts as a buffer between RAM and CPU. Cache memory holds the data and instructions that are frequently requested so that it is available to the CPU for the need.

BIOS is a program, stands for basic input/output system, which is stored in non volatile memory like ROM (Read Only Memory) or flash memory that allows you to set up and access your computer system at the greatest basic level.

ROM (Read only Memory):-



- The information is burnt (pre-recorded) into the ROM chip at manufacturing time.
- Once data has been written into a ROM chip, it cannot be erased but you can read it.
- When we switch OFF the computer, the contents of the ROM are not erased, but remain stored permanently.
- ROM is a non-volatile memory.

Programmable Read Only Memory – PROM

- PROM is a memory on which data can be written only once.
- A variation of the PROM chip is that it is not burnt at the manufacturing time.
- PROM is also a non-volatile memory.

Erasable Programmable Read Only Memory – EPROM

- EPROM is non-volatile memory.
- An EPROM differs from a PROM in that a PROM can be written to only once and cannot be erased. An ultraviolet light is used to erase the contents of the EPROM.

Electrically Erasable Programmable Read Only Memory – EEPROM

- EEPROM is not as fast as RAM
- It Does not require ultraviolet light to erase its content.
- A flash memory is a special type of EEPROM that can be erased and re-programmed.

Secondary Storage Devices

Magnetic Devices:-

1) Floppy Disk:-

- **IBM** Company Introduces the Floppy Disk in 1972.
- **Floppy Disk Driver** is required to use Floppy Disk.
- There are 3 Types of Floppy Disk
- 8 Inch Floppy Disk = 1.2 MB Storage
- 5 ½ Inches Floppy Disk = 1.2 MB Storage
- 3½ Inches Floppy Disk = 1.44MB (Presently we Use it)

2) Hard Disk:-

- In Earlier days IBM Organization Introduces 100MB Hard Disk & named it as WINCHESTER DISK.
- The Speed of Hard Disk Measured through RPM. (Revolutions per Minute)

3)Magnetic Disk:

- It is a Serial Access Memory.

Optical Devices:-

1)C.D(Compact Disk):-

- It uses Laser Light to Store Data.
- In 1976 Sony Company Introduces Compact Disk.
- Commonly used Compact disk size is 12CM and its Storage is 700MB.
- Mini Compact Disk sixe is 8CM and its Storage is 180/200MB.

2)DVD (Digital Versatile Disk)

- It uses Laser Light to Store Data.
- 1995 Sony Company
- Commonly used size is 12CM and its Storage is 4.7GB.
- Mini size is 8CM and its Storage is 2.5GB.

3) Blue-Ray Disk:-

- It uses Laser Light to Store Data.
- Sony Company
- Commonly used size is 12CM and its Storage is 25GB.
- Mini size is 8CM and its Storage is 7.8GB.

Flash Drives:

- These are Portable.
- Example:- Pen drives, SD Cards

Output Unit:-

It is used to print or display the results, which are stored in the memory unit. The actual function of the output unit is just the reverse of the input unit. Thus, the output unit links the computer to the outside world. The Monitor and Printer are the most commonly used output devices.

Monitor:-

			
CRT	LCD	TFT	LED
Cathode ray tube	Liquid Crystal Display	Thin Film Transistors	Light Emitting diode

- Quality is Measured by resolution.
- Mono Chrome Monitor (B&W)
- Multi Chrome Monitor(colour)

CRT: Cathode Ray Tube

- The first computer monitors used cathode-ray tubes (CRTs).
- The display was Monochromatic

LCD:- Liquid Crystal Display

Lower power consumption, Lighter weight, and smaller physical size of LCDs, higher price versus a CRT.

- The first standalone LCDs appeared in the mid-1990s

Plasma TV:-

- High Picture Quality.
- High Power Consumption

Printer:-

- The programs and data present in the memory is called as soft copy.
- The programs and data present on the paper is called as hard copy

Dot Matrix Printer:-

- 1970 by Digital Equipment Corporation.
- Uses Ribbon
- Speed is Measured by (300) Character Per Minute (CPM)
- Less Printing Quality.
- Less cost to Print.
- Very Noisy
- Less Speed Printing.

Inkjet Printer & Line Printer:-

- Line printers are high-speed printers capable of printing an entire line at a time.
- A line printer can print 150 lines to 3000 lines per minute.
- They cannot print graphics, the print quality is low and they are noisy to operate.
- It can print large volume of text data very fast compared to the other printers
- Speed Line Per Minute (LPM)

Laser Printer:-

- Laser printers use a laser beam and dry powdered ink to produce a fine dot matrix pattern.
- It can produce very good quality of graphic images.
- The available resolutions range from 300 dpi at the low end to around 1200 dpi at the high end.
- Speed Page per Minute. (PPM)
- High Cost Printing & High Quality Printing.

Plotter Printers :-

Plotter is an output device that draws pictures on paper based on commands from a computer. Plotters differ from printers in that they draw lines using a pen. plotters are considerably more expensive than printers. They are used in engineering applications where precision is mandatory

Speaker:-

The speakers are the output units. The sound signals from analog / digital are converted into audible frequency in the speakers and produce voice output (audio data).

Note: The input unit, an output unit, and secondary storage devices are together known as Peripheral Devices.

Mother Board

There are various types of motherboards available depending on the processors that are used. Some of them are XT, AT, Baby AT and ATX motherboards.

The motherboard components are:

- Processor (CPU)
- CMOS
- Disk Controllers
- BIOS
- Slots
- * I/O Ports and Interfaces

Slots:-

A slot is an opening in a computer where you can insert a printed circuit board. Slots are often called expansion slots

There are several types of slots:

1) **ISA (Industry Standard Architecture) slot** – ISA slot is used to connect modem and input devices.
2) **PCI (Peripheral Component Inter Connect) slot** – PCI slots are used to connect graphics accelerator cards, sound cards, internal modems or SCSI cards. They are much faster than ISA cards.
3) **AGP (Accelerated Graphic Port) slot** – AGP slot is meant to provide faster access to a graphics accelerator card.
4) **RAM slot –**

- RAM slot is used to install memory and is of two types. They are SIMM (Single Inline Memory Module) slot and DIMM (Dual Inline Memory Module) slot.
- The original Pentium systems typically have either four 72-pin SIMM slots, or two 168-pin DIMM slot to install memory.

5) **PC Card** – It is used in laptop computers. It includes Wi-Fi card, network card and external modem.
6) **Processor slot** – Processor slot is used to insert the processor chip which is the largest chip on the motherboard. It can be identified, as a heat sink or fan is located on top of it.

I/O Ports:-

The ports and interfaces are used to connect external devices like printers, keyboards or scanners to the computer.

- **Serial port** is also known as communication (COM) ports or RS232-c ports. They are used for connecting communication devices like mouse and modem.
- **Parallel ports** are used to connect external input/output devices like printers or scanners.
- **IDE (Integrated Digital Electronics)** port IDE devices like CD-ROM drives or hard disk drives are connected to the motherboard through the IDE port.

USB port

- USB port gives a single, standardized, easy-to-use way to connect a variety of newer peripherals to a computer.
- These devices include printers, scanners, digital cameras, web cameras, speakers etc.
- USB supports a data speed of 12 megabits per second, supporting up to 127 devices.
- USB is a plug- and-play interface between a computer and add-on devices.

AGP (Accelerated Graphics Port) port

The AGP port is used to connect to graphic card that provides high-speed video performance typically required in games and other multimedia applications.

- **SCSI (Small Computer System Interface) port**

This port is used for adding external devices such as high-speed hard-disks, high-end scanners and CD-ROM drives. It does fast data transfers and I-O operations.

- **VGA (Visual Graphics Adaptor)** port connects monitor to a computer's video card. It has 15 holes and is

Similar to serial port connector, but serial port connector has pins, this has holes.

- **Ethernet Port** connects to a network and high speed Internet. It connects network cable to a computer. This

port resides on an Ethernet Card. Data travels at 10 megabits to 1000 megabits per second depending upon the network bandwidth.

- **DVI (Digital Video Interface)** port connects a Flat panel LCD monitor to the computer's high-end video graphic cards. It is very popular among video card manufacturers.

Power Supply to a Computer System

- Electric power is the main source of supply for the operation of electronic components of a computer.
- There are two types of power supply connected to a computer system. They are, Switch Mode Power Supply (SMPS) and Uninterruptable Power Supply (UPS).
- There are two types of UPS: Online UPS and Standby UPS

Online UPS:-

An online UPS avoids those momentary power lapses by continuously providing power from its own inverter, even when the power line is functioning properly. Online UPS is more costly than Standby UPS

Standby UPS :- A Standby UPS (or off-line UPS) monitors the power line and switches to battery power as soon as it detects a problem. The switch over to battery, however, can require several milliseconds, during which time the computer is not receiving any power.

Chapter-2
Evolution of computer:

Abacus

Approximately 4,000 years ago, the Chinese invented the Abacus. It was the first machine used for counting and calculating. It is made of a wooden frame, metal rods, and wooden beads Abacus was mainly used for addition, subtraction and later for division and multiplication. Today, the abacus is still used widely in China and other Asian countries to count and calculate, just as we use calculators.

Napier's bones

In the early 17th century, **John Napier**, a Scottish mathematician, invented another calculating tool. "Napier's bones" was based upon manipulation of rods with printed digits. The rods were madeof bone, ivory, wood or metal. The set consists of 10 rectangular blocks with multiples of a different digit on each of the four sides.

The slide Rule

The slide Rule was invented by **William Oughtred**. It is based on the principle that acutal distance from the starting point of the rule is directly proportional to the logarithm of the numbers printed on the rule. The slide rule is embodied by the two sets of scales that are joined together, with a marginal space between them.

Adding Machine-Pascaline

In 1642, at the age of 19, a French mathematician by the name of **Biaise Pascal** invented the Pascaline. The Pascaline is known as the first mechanical and automatic calculator.

The Pascaline was a wooden box that could only add and subtract by means of a series of gearsand wheels. It had a box with eight movable wheels called **dials**. When each wheel rotated one revolution, it would then turn the neighbouring wheel.

Leibniz Calculator

Mathematician **Gottfried Leibniz** built a calculator in 1650 that could add, subtract, multiply and divide the numbers.

Jacquard loom

In 1801, **Joseph Mary Jacquard** invented the Jacquard loom. A power loom that used punched wooden cards to automatically weave incredibly detailed patterns including pictures and text. This can be taken as the first "Read only Memory" device.

Difference and Analytical Engine

In the early 1820s, an English mathematician by the name Charles Babbage designed a computing machine called the Difference Engine. This machine was to be used in the calculating and printing of simple math tables.

In the 1830s, he designed a second computing machine called the Analytical Engine. This machine consisted five units, which became the basic principle for the development of modern computer. Hence Charles Babbage is known as the "Father of Computers".

1833-First Women Programmer

Lady Ada Lovelace was a first computer programmer, who designed program for Babbage's Analytical Engine.

1890 AD – Hollerith Tabulating Machine

In 1889, an American named **Herman Hollerith** invented a counting machine to count the population of USA. This electronic machine is able to read the information on the punched cards and process it electronically. Herman Hollerith was the founder of the company than became famous as IBM.

Generations of Computer

Depending on the development of the technology the generation of computer is classified intofive generations.

First Generation of Computer (1940-1956)

- The first generation of computers is started with using **vacuum tubes** as the basic components.
- The speed of these computers was very slow, storage capacity was very less and these computers are large in size.
- This generation computers operated only on machine language.
- Input was based on punched card, paper tapes an output was obtained as printout.
- IPS: Instructions Per Second
- Speed:-300IPS
  Some computers of this generation were
  ENIAC (Electronic Numerical Integrator andCalculator),
  UNIVAC (Universal Automatic Computer).
  EDVAC:- Electronic Discrete variable automatic computer

ENIAC:

- It stands for **Electrical Numerical Integrator and Computer.**
- It used a word of ten decimal digits instead of binary ones like previous automated calculators /computers.

EDVAC

- It stands for **Electronic Discrete Variable Automatic Computer.**
- It was to be a vast improvement upon ENIAC. Muchly and Eckert started working on it twoyears before ENIAC even went into operation.
- This idea was to have the program for the computer stored inside the computer.

UNIAC

- **Universal Automatic Computer** was the first commercial computer produced in the United States.

Second Generation of Computer (1956-1963)

- In this generation **transistors** were used in place of vacuum tubes.
- These machines were much faster, more reliable than their earlier machines.
- It generates less heat and consumed less electricity as compared to first generation computers.
- Second Generation computers used punched cards for input and printout for output.
- This computer moved from the use of machine language to assembly languages.
- The computer stored their instructions in their memory, which moved from magnetic drum to magnetic core technology.
- Speed :-300+IPS.
- Some computers of this generation were IBM 1620, IBM 7094, CDC (Control DataCorporation) 1604 and 3600.

Third Generation of Computer (1964-1971)

- In the third generation of computer **Integrated Circuits (IC's)** were used in place of transistors.
- In this generation, Keyboard and monitors were used instead of punched cards and printout.
- These IC's were increased the speed of processing and storage capacity.
- These computers were more reliable, smaller in size and faster.
- Maintenance cost was low comparing to the previous generation and consumed less electricity.
- Speed:-1 MIPS
- Some computers of this generation were IBM-360 series, Honeywell-6000 series, PDP(Personal Data Processor), IBM-370/168.

Fourth Generation of Computer (1971-1980)

- In the fourth generation of computer, **microprocessors** were used in place of Integrated Circuits (IC's).
- The fourth generation of computers is marked by the use of Very Large Scale Integrated (VLSI) circuits.
- This made computers smaller in size became more powerful, they could be linked to form network.
- Speed:- more than 1 MIPS .

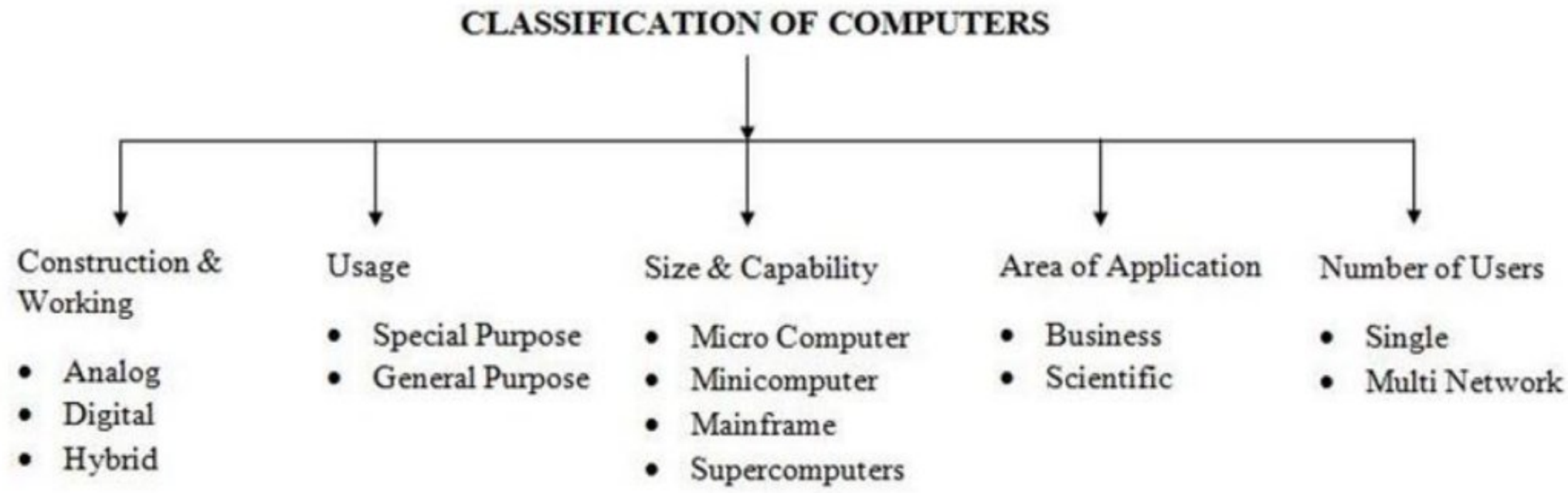
Some computers of this generation were Mini Computer and Mainframe computer, Personal computers.

Fifth Generation of Computer (1980-till date)

- Fifth generation computer involves the concept of **Artificial Intelligence (AI)** which made the computer think like human beings.
- This generation uses VLSIIntegration) technology.
- (Very Large Scale integration) and ULSI (Ultra Large Scale
- These computers are more intelligent and faster comparing to other generation computers.
- High Speed.
- Types of this generation computers are Desktop, Laptop, Notebook, and Robot. etc.

Remember	**Generations of Computer**	
Generation	**Material used**	**Features**
First Generation	Vacuum tube based	very slow, large in size and storage capacitywas very less
Second Generation	Transistor based	faster, more reliable than their earlier machines
Third Generation	Integrated Circuit based	Smaller in size and faster. Maintenance cost was low comparing to the previous generation
Fourth Generation	VLSI mic roprocessor based	Fourth Generation computers became morepowerful, reliable and more efficient.
Fifth Generation	ULSI microprocessor based	These computers are more intelligent and faster comparing to other generation computers.

Classification of Computer:



Classification based on Purpose

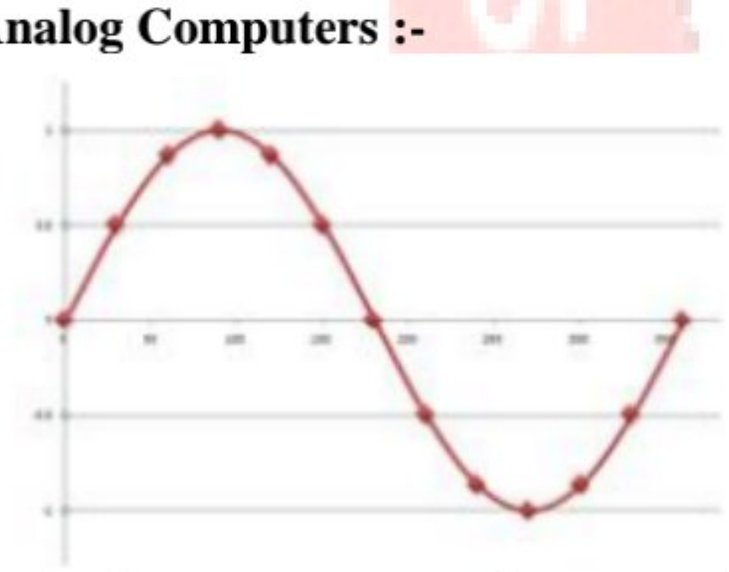
According to purpose, computers are classified into general purpose and specific purpose. **General purpose computers** are designed to perform a range of tasks. They have an ability to store numerous programs but lack in speed and efficiency. Specific purpose computers are designed to handle a specific problem or to perform a specific task.

Classification based on Principles of Operation

According to principles of data handling, computers are classified into three types

1. Analog Computers
2. Digital Computers
3. Hybrid Computers

Analog Computers :-



- Analog computers work upon continuous data.
- It Gives only approximate result.
- Speed of analog computers is less than the digital computers.
- Analog computer has very low or limited memory and it can store less amount of data.
- Analog computers are difficult to use.
- Power consumption is high.
- They are usually special purpose devices.
- It can be general purpose devices.
- **Examples** includes analog clock and thermometer etc.

Digital Computer

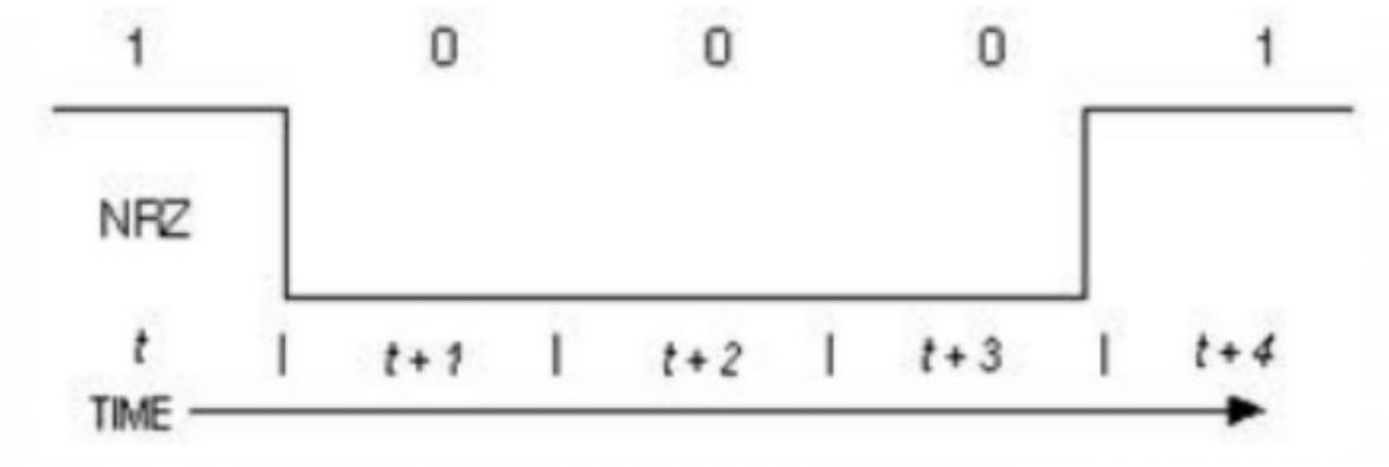


Figure1.22 Digital Graph with 0's and 1's

- The digital computer works upon discontinuous data.
- It Works upon Discrete value of data.
- Speed of digital computers is more than the analog computers.
- Digital computer has very big memory it can store large amount of data.
- Digital computers are not so difficult to use.
- Power consumption is low.
- **Examples** includes Digital laptop, digital camera, digital watches etc.

Hybrid Computers

- Hybrid computer are the combination of both analog and digital computer.
- They accept both the analog and digital data for processing.
- Hybrid computers incorporate the measuring feature of an analog computer and counting feature of a digital computer.
- For computational purposes, these computers use analog components and for storage, digital memories are used.

Now-a-days analog- to- digital computer (ADC) and digital-to analog computer(DAC) are used to transforming data into suitable form.

Hybrid computers are best used in the hospital where the analog part is responsiblefor measurement of patient's heart beat, blood pressure, temperature and other vital signs and then the operation is carried out in a digital fashion to monitor patient's vital signs. Hybrid Computers are also used in weather forecasting.

Differences between Analog & Digital computers

Analog Computer	**Digital Computer**
Operates on continuous values of data	Operates on discrete values of data
They give only approximate results	They give accurate results
Processing is slow	Processing is fast
They have very limited use	They are versatile
They have small memory & less reliable	They have large memory & more reliable

Classification based on Configuration

Based on the performance, size, cost, capacity, the digital computers are classified into four types:

1.Micro Computers
2.Mini Computers
3.Mainframe Computers
4.Supercomputers

Micro Computers

- Also, know as PC (Personal Computer), it was introduced in 1970.
- The number of processors in microcomputers will be one or two processors.
- It contains input devices, output devices, storage device and processor.
- The number of processor will be one or two. It is used by one person at a time.

Example: Desktops (PC, Macintosh), Laptops, Notebooks, Tablets, Palmtops, Smart Phones.

Uses of Micro computers

- They are used as desktops either in offices or even in homes.
- Children enjoy playing games & watching movies in these computers.
- They are cheap and user-friendly.
- Their operation can be easily learned by anyone having the logical aptitude.

Mini Computers

- Mini computers were introduced in the 1960's.
- Minicomputer is larger and more powerful than personal computer.
- In can execute five million instructions per second.
- It generally consists of two or more processors.
- Minicomputer can serve up to 4000 connected users simultaneously.
- It is normally accessed by users via personal computer or terminal. A device with a monitorand keyboard is called terminal.
- It is also known as dumb terminal. It has no processing power and cannot work as stand-alone computer.

Example: Digital Alpha, VAX-800, AS 400

Uses of Mini computers

- They are often used by small and medium sized companies to provide centralized store of information.
- They are used for data processing.

Mainframe Computers

- Mainframe computers were introduced in 1975.
- It is very large computer in size.
- It is more powerful than mini computers and consists of multiple processors.
- It is designed to perform multiple tasks for multiple users at the same time.
- The user access a mainframe computer through personal computer.
- It can execute 16 million instructions per second.

Example: CDC 6600, NEC 610, DEC 10

Uses of Mainframe Computers

- Mainframe computers are used in large organizations.
- They are big computer systems sensitive to temperature, humidity, dust etc.
- Qualified & trained operators are required to operate them.
- They have a wide range of peripherals attached.
- They have large storage capacity.
- They can use a wide variety of software's.
- They are not user-friendly.
- They can be used for more mathematical calculations.

Supercomputers

- Supercomputers were introduced in 1980. Super computer is the fastest computer.
- Supercomputer is the biggest in size and the most expensive in price than any other computers.
- Supercomputer is the most sophisticated, complex and advance computer.
- It has a very large storage capacity.
- It can process trillions of instructions in one second.
- Supercomputers are used for highly calculations intensive task.
- Supercomputers are designed for ultra-high performance tasks such as weather analysis,encryption cracking, and the creation of animation.

Example: IBM Roadrunner, IBM Blue Gene, PARAM Padma, etc.

Father of Super Computer: Seymour Cray CRAY -1

The CDC 6600 is considered the first supercomputer. It was designed by Seymour Cray – often considered the father of supercomputing – while he was working at the Control Data Corporation (CDC).

Father of Indian Super Computer:-Vijay Panduranga Bhatkar PB

PARAM is a series of Indian supercomputers designed and assembled by the Centre for Development of Advanced Computing (C-DAC) in Pune.

PARAM 8000 [1990]

- Fastest Supercomputer in INDIA:- AIRAWAT supercomputer [75/500] (June 2023)

Uses of Supercomputers

- Weather Forecasting
- Animated Graphics like Hollywood Movies
- Nuclear energy research
- Space Science
- Weapons and Missile design
- Petroleum Exploration etc.

Supercomputer in India

India's supercomputer program was started in the late 1980s because Cray supercomputers were denied for import due to an arms embargo imposed in India, as it was a dual use technology and could be used for developing nuclear.

PARAM 8000 was India's first supercomputer. It was indigenously built in 1990 by Centre for Development of Advanced Computing and was replicated and installed at ICAD Moscow in 1991 under Russian collaboration.

Supercomputer	Organization
Anupam	Bhabha Atomic Research Centre (BARC)
SAGA-220	Indian Space Research Organization (ISRO)
EKA	Computational Research Laboratories
Vikram-100	Physical Research Laboratory
PARAM Yuva	Centre for Development of Advanced Computing

Applications of computers:

- Schools and colleges
- Banks
- Office
- Stock control in business firms
- Stock exchange
- Research and developments
- Entertainment and news
- Government office
- Satellite communication
- Publishing
- Travel
- Computer-aided manufacturing (CAM)
- Hospital.

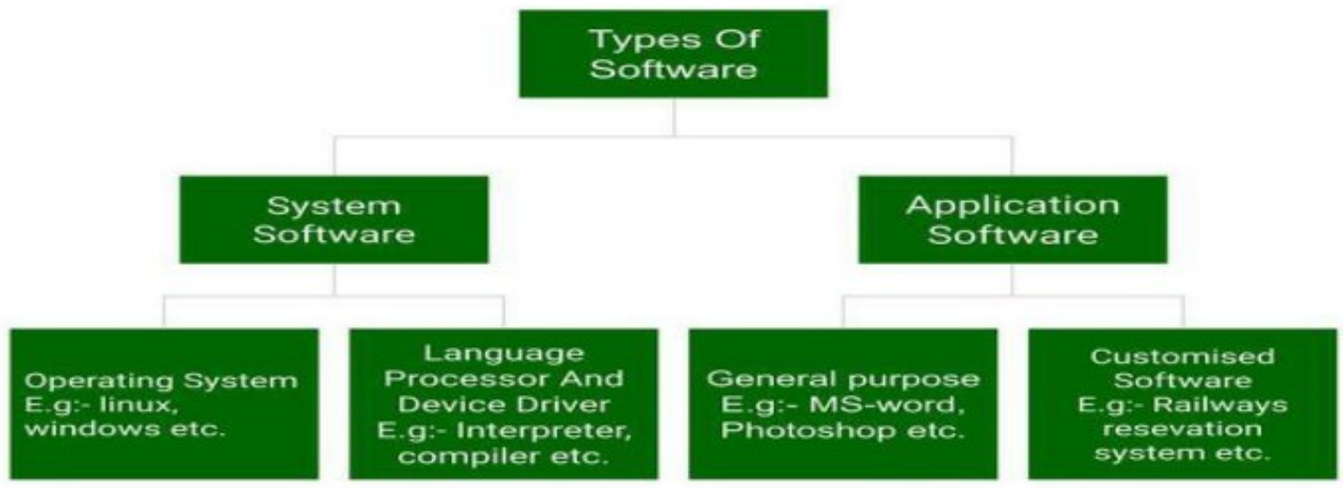
1. World First Super computer – Seymour Cray unveiled the CRAY-1 in 1976.
2. World Latest Super Computer-Frontier
3. Indian First Super Computer-PARAM 8000
4. Indian Latest Super Computer-AIRAWAT
   - India's AI Supercomputer 'AIRAWAT' has been ranked at No. 75.
   - Its Operating system is UBUNTU & it is Developed by Netweb Technologies.

Chapter:-3
Software & Operating System

A set of instructions that tells the computer about the tasksto be performed and how these tasks are to performed, is known as **Software.**

The set of instructions, which control the sequence of operations, are known as **Program.** It is a sequence of instructions, written to perform a specified task with a computer.

Software is the set of programs, procedures, algorithms, and documents concerned with the operation of a data processing system".



Application software is a group of program designed forfulfill the demand of end user .
e.g. MS office, PowerPoint, Windows Media Player.

- There are again two broad categories of application software— **general purpose** and **customized application software.**

System software is a program which is created for the system and to make the system user friendly such as operating system or is a type of computer program that is designed to run a computer's hardware and applicationprograms.

System software is a collection of systems programs to perform common tasks.

Utility software designed to help analyze, configure, optimize or maintain a computer such antivirus software.

Operating system is a set of programs that help in controlling and managing the hardware and the software resources of acomputer system.

An operating system is a set of programs which acts as an interface between the user and the computer

Main functions of operating system are

➢ **Process management**

- Control access to shared resources like file, memory, I/O and CPU.
- Control execution of applications.
- Create, execute and delete a process (system process or user process).
- Cancel or resume a process.
- Schedule a process.
- Synchronization, communication and deadlock handling for processes

➢ **Memory management**

- Allocate memory,
- Free memory,
- Re-allocate memory to a program when a used block is freed,
- Keep track of memory usage

➢ **File management**

- Create and delete both files and directories,
- Provide access to files,
- Allocate space for files,
- Keep back-up of files,
- Secure files.

➢ **Security's**

- OS protects the resources of system. User authentication, file attributes like read, write, encryption, and back-up of data are used by OS to provide basic protection.

➢ **Device Management**

- Open, close and write device drivers,
- Communicate, control and monitor the device driver

Functional Features of commonly used operating systems

The operating system in general, provides a user interface to interact with the computer.

There are two types of user interfaces

- Command-line user interface (CUI)
- Graphical user Interface (GUI)
- Touch-based Interface (TBI)
- Voice-based Interface (VBI)
- Gesture-based Interface(GBI)

Key	**GUI**	**CUI**
Interaction	User interacts with computer using Graphics like images, icons.	User interacts with computer using commands like text.
Navigation	Navigation is easy.	Navigation is difficult.
Peripherals used	Keyboard, mouse or any other pointing device.	Only keyboard.
Precision	GUI has low precision.	CUI has high precision.
Speed	GUI is of low speed.	CUI is of high speed.
Usage	Usage is easy.	Usage is difficult, requires expertise.
Memory requirement	High memory requirement.	Low memory requirement.
Flexibility	Highly flexible user interface.	Little flexible user interface.
Customize	GUI is highly customizable.	CUI appearance is not easily changeable.

Types of Operating System.

1. **Batch operating system :** Here data and program thatneed to be processed are bundled and collected as a batch and executed together.

2. **Multiprogramming operating system :** It allowsthe instruction and data from two or more separate process to reside in primary simultaneously. Multiprogramming system are multitasking multiuser and multiprocessing operating system

3. **Single user** : It is designed for single user and a single person use it at a time i.e. DOS window's 95 etc.

4. **Distributed operating system** : It is the one which manages a collection of independent computers and makes them appear to the user of the system as a single computer.

5. **Operating System (RTOS)** : It is a computing environment that reacts to input within a specific time period. It is used at those Places in which we Requires higher and Timely Response.

6. **Time Sharing System:** A time sharing system allows the many users to simultaneously share the computer resources. Since each action or command in a time-shared system takea very small fraction of time, only a little CPU time is neededfor each user.

7. **Mobile OS/Windows 10 Mobile** is the latest name forMicrosoft's phone and tablet operating system. Google's latest's version of its android OS is **Nougat** and iOS i.e. iPhone Operating System's latest version is **IOS 10.**

List of Operating System

- Windows Operating System
- Linux Operating System
- Mac Operating System
- Android Operating System
- IOS
- Chromium Operating System
- Ubuntu Operating System
- Fedora Operating System
- BlackBerry Operating System
- Free DSB Operating System
- DOS : Disk Operating System

Free software:-

Free software means the software is freely accessible and can be freely used, changed, improved, copied and distributed by all who wish to do so. And no payments are needed to be made for free software.

Example:- VLC media player, Python, Linux.

OSS Software:-

OSS refers to Open Source Software, which refers to software whose source code is available to customers and it can be modified and redistributed without any limitations. An OSS may come free of cost or with a payment of nominal charges that its developers may charge in the name of development, support of software.

Example:- PHP, MySQL , Mozilla Firefox, GNU, Python.

FLOSS software:-

- FLOSS refers to Free Libre and Open Source Software or to Free Livre and Open Source Software.
- The term FLOSS is used to refer to software which is both free software as well as open source software.

  Example:- Linux

Free Software Foundation:-

- FSF is Free Software Foundation. FSF is a non-profit organization created for the purpose of supporting free software movement.
- Richard Stallman founded FSF in 1985 to support GNU project and GNU licenses.

Proprietary Software:-

- Proprietary Software is the software that is neither open nor freely available.
- Its use is regulated and further distribution and modification is either forbidden or requires special permission by the supplier or vendor.
- Source code of Proprietary Software is normally not available.
- Example:- Windows, IOS, Linux, Microsoft etc.

Chapter:-4
Computer Language

Programming language is a set of rules called syntax which the user has to follow, to instruct the computer what operations are to be performed.

Low Level Language : These are coded in a form which is easy to understand by the Processor.

Machine language:
It is also a type of low level language these can be develop in binary language (0 and 1) .

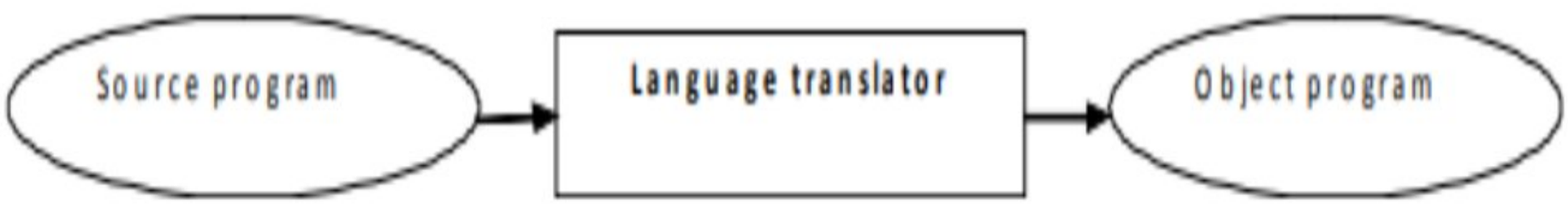
Assembly language:
- It is also a type of low level language and using the human readable instruction of the CPU.
- It is written as 'MOVA.'
- The disadvantages of a machine language lead to the development of a new programming language which uses symbolic instructions called as assembly language.
- It replaced them with symbolic codes.
- **These symbolic instruction codes of machine language are referred to as the mnemonics.**

Example:-
- ADD for addition
- SUB for subtraction
- MUL for Multiplication
- STA for storing value in accumulator
- HALT for Halt

High level language
- High level language programmer can write code in simple easy language,
- It is user friendly .
- The high level languages are English-like languages and are machine independent.
- The high level languages were developed to overcome the difficulties of low level languages.
- Some of the High Level Languages are BASIC, COBOL, FORTRAN, PASCAL, C, C++ and JAVA.

Language Translator :

Programmers write their program in one of the high level language because it ismuch easy to code in these language but computer does notunderstand any of these language so it is necessary to convert program into a machine language so translator do this work.



There are three types of translator programs:
1. Assembler
2. Compiler
3. Interpreter

Interpreter

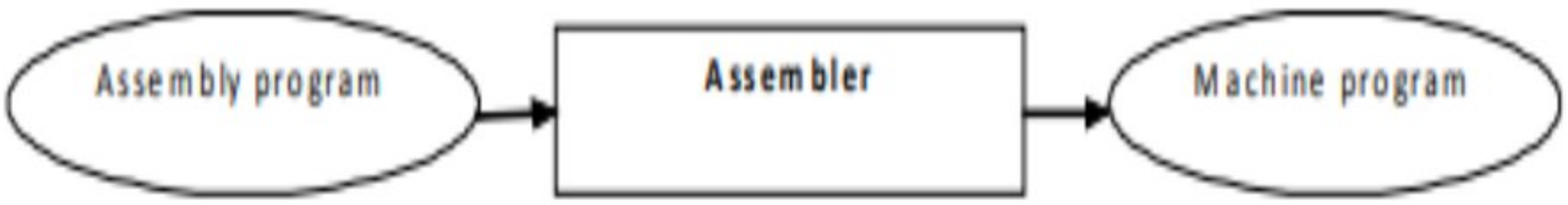
- It converts high level language program into machine language.
- It is very slow because it convert program line by line.
- Interpreter is a language processor that translates an instruction of a high-level language program and immediately executes it before translating the next instruction of the source program.

Compiler:

It also translates the program from high level language to machine language. It is very fast because it converts the whole program into machine language.

Assembler:-

- It is used for converting the code of low level language (assembly language) into machine level language.
- Assembler is system software which translates programs written in assembly language into machine language.



Loader: It loads the code which is translated by translator into the main memory and makes it ready to execute.

Linker:- is used to combine all the object files and convert them into a final executable program.

C language:

- Father of 'C' Language – Dennis Ritchie
- It is a middle level programming language and also known as procedural language.

C++(C Plus Plus)

- Father of 'C++' language - Bjarne Stroustrup
- **C++** is high level language that uses the OOPS concept.

Fortran:

- It is known as formula translation.
- It is used for scientific application.
- It is a first programming language.

COBOL (Common Business Oriented Language):

Used for record keeping and data management in business organizations.

BASIC (Beginner's All Purpose Symbolic Instruction Code): first language designed for non-professional programmers.

PASCAL: It is developed as a teaching tool for programming concepts.

Java

- Father of 'Java' – James Gosling
- It is a High Level Language
- The Java programming language is designed especially for use in distributed applications on corporate networks and the Internet.

Simula was the first object-oriented programming language**. Java, Python, C++, Visual Basic .NET and Ruby** are the most **popular Object Oriented Programming languages**.

Ruby is used in many Web applications. **Curl,Smalltalk, Delphi and Eiffel** are also examples of object-oriented programming languages.

OOP's Concept

a. Class
b. Object
c. Data Encapsulation
d. Abstraction
e. Inheritance
f. Polymorphism
g. Message Passing
h. Dynamic Binding

Front –End Languages

- JavaScript.
- HTML.
- CSS.
- ReactJs.
- Typescript..
- Angular.
- Swift.
- JQuery

Back End Languages

- JavaScript.
- Python.
- Java.
- Ruby.
- PHP.
- C#
- Perl

DataBase

- MangoDb
- MySql
- SQL
- Postgre Sql
- Amazon RDS
- Razor SQL

Programming Languages Used in Social Media

Social Media	Front-End Language	Back-End Language	Note
Google	JavaScript, Type-Script	C,C++,Java, Python, NodeJs	The most used search engine in the world.
Facebook	JavaScript, Type-Script	C++,Java, Python	The most visited social networking site.
YouTube	JavaScript, Type-Script	C,C++,Java, Python, Go	The most popular video sharing site.
Amazon	JavaScript	Java, C++,Perl	The most used e-commerce site in the world.
Wikipedia	JavaScript	PHP	A free online encyclopedia based on Media Wiki,
LinkedIn	JavaScript	Java, JavaScript	World's largest professional network.
Netflix	JavaScript	Python ,Java	The biggest video streaming service in the world

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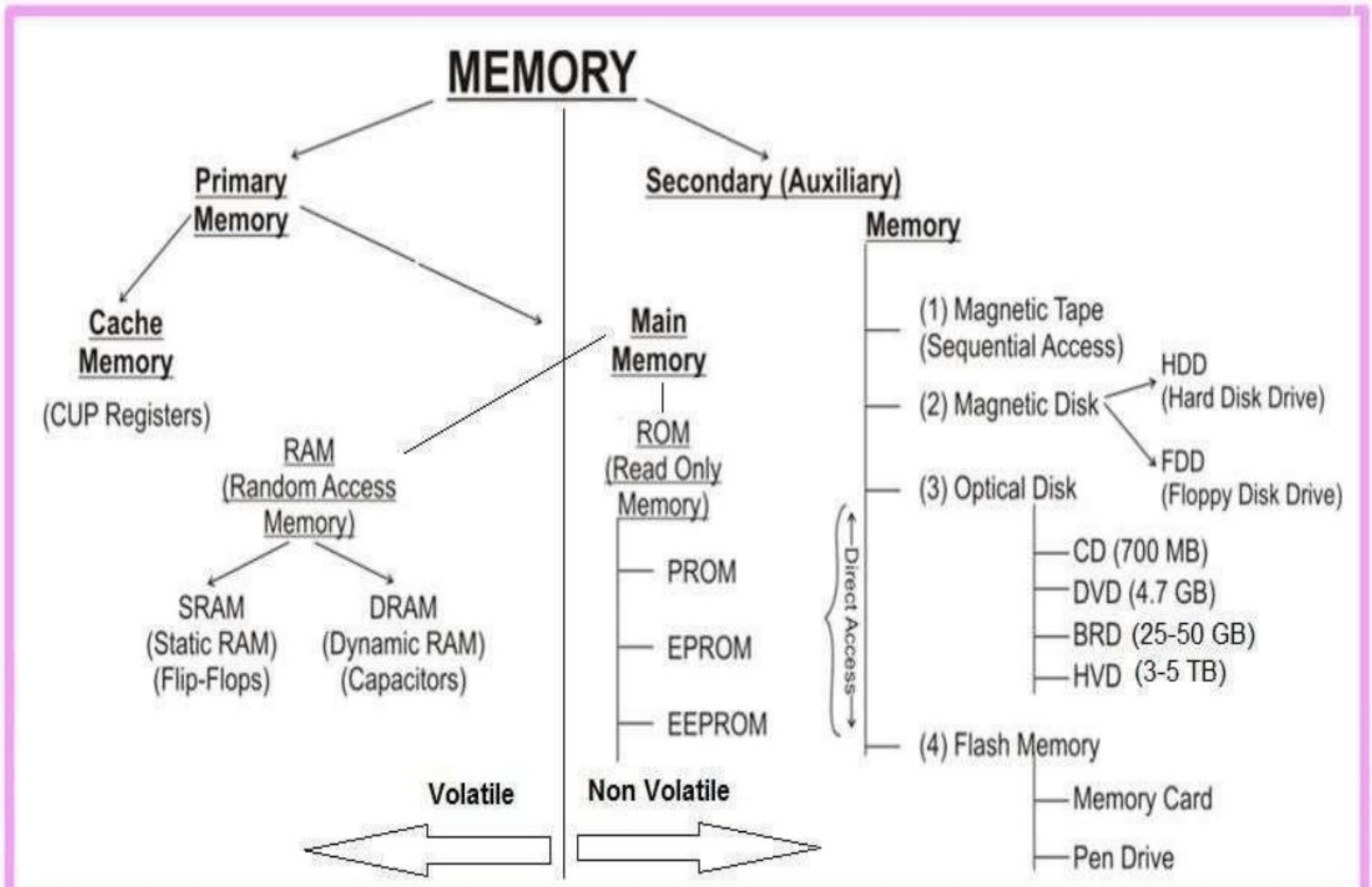
Chapter : 5
Memory Management



8 bit	**1 byte**
1 Nibble	**4 bit**
1024 Byte	**1 Kilo Byte (KB)**
1024 KB	**1 Mega Byte (MB)**
1024 MB	**1 Giga Byte (GB)**
1024 GB	**1 Tera Byte (TB)**
1024 TB	**1 Peta Byte (PB)**
1024 PB	**1 Exa Byte (EB)**
1024 EB	**1 Zeta Byte (ZB)**
1024 ZB	**1 Yota Byte (YB)**

Primary Storage (memory), also known as main storage

- It is the area in a computer in which data is stored for quick access by the computer's processor.
- The terms random access memory (RAM) and memory are often as synonyms for primary or main storage.
- Primary storage is volatile and can be contrasted with non-volatile secondary storage, alsoknown as auxiliary storage.

Cache memory

- It is a smaller, faster memory which stores copies of the data from frequently used main memory locations.
- A CPU cache is a hardware cache used by the central processing unit (CPU) of a computer to reduce the average time to access data from the main memory.

Registers

- The registers are high speed temporary storage areas located inside the CPU.
- The CPU gets the data and instructions from the cache or RAM, the data and instructions are moved to registers for processing.
- These registers work under the direction of the control unit (CU) to accept, store and transfer instructions or data, and perform arithmetic or logical comparisons at high speed.

Read-only memory (ROM)

Rom is a storage medium used in computers and other electronic devices. Data stored in ROMcan only be modified slowly or with difficulty, or not at all.

ROM is non-volatile and the contents are retained even after the power is switched off. It only allows reading.

The types of ROM include PROM, EPROM and EEPROM.

PROM - (programmable read-only memory) is a memorychip on which data can be written only once.

The difference between a PROM and a ROM (read-only memory) is that a PROM is manufactured as blank memory,whereas a ROM is programmed during the manufacturing process. To write data onto a PROM chip, you need a specialdevice called a PROM programmer or PROM burner.

1. **EPROM** - (erasable programmable read-only memory) is aspecial type of PROM that can be erased by exposing it to ultraviolet light.

2. **EEPROM** - (electrically erasable programmable read-onlymemory). EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge.

Random Access Memory (RAM), allows the computer to store data for immediate manipulation and to keep track ofwhat is currently being processed.

RAM is referred to as **volatile memory** and is lost when the power is turned off.

It also known as read/write memory as information can be read from and written onto it.

The two main types of RAM are **Static RAM** and **DynamicRAM**.

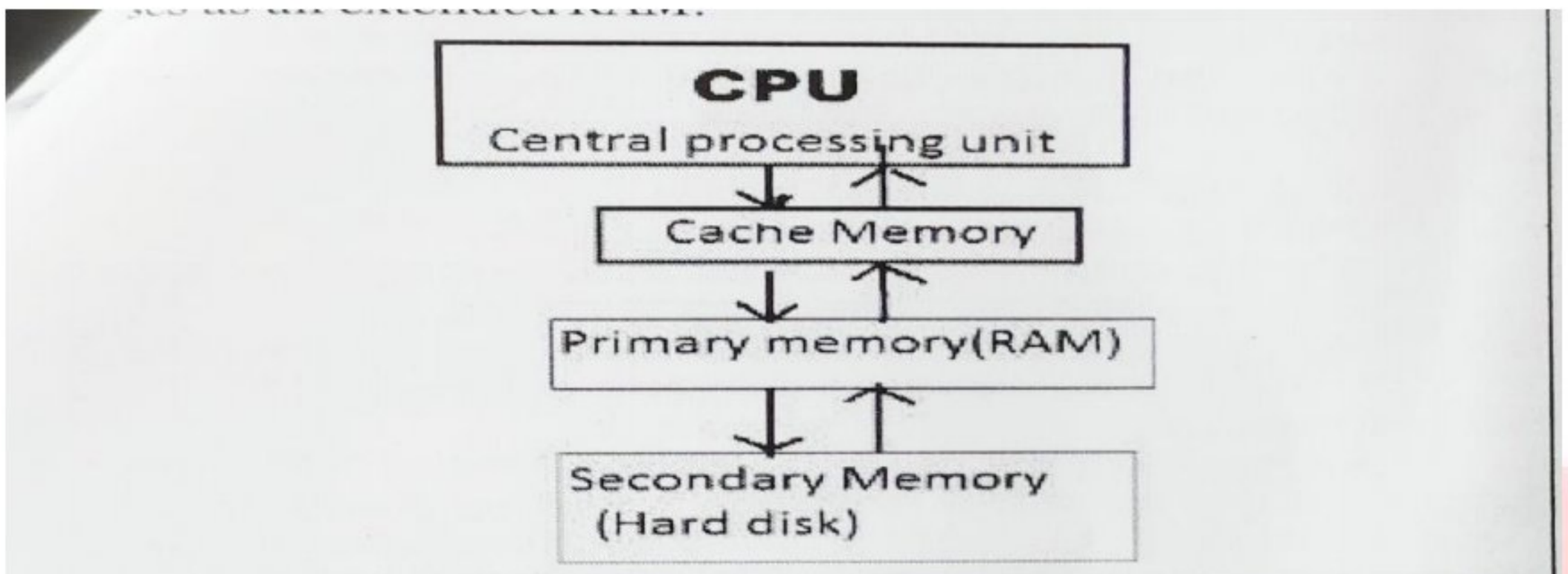
SRAM retains data as long as power is provided to the memory chip and need not be refreshed periodically. It is often used as CPU Cache memory. SRAM stands for Static Random Access Memory.

The data on **DRAM** continues to move in and out of the memory as long as power is available and must be continually refreshed to maintain the data. DRAM stands for Dynamic Random Access Memory.

Virtual memory is memory on the hard disk that the CPU uses as an extended RAM.

Secondary memory

- It is where programs and data are kept on a long-term basis.
- Common secondary storage devices are the hard disk and optical disks.
- The hard disk has enormous storage capacity compared to main memory.
- The hard disk is usually contained inside the case of a computer.



	Access Time	Storage Capacity	Cost per bit of storage
Primary memory	Faster	Smaller	High
Secondary memory	Slower	Higher	Low

Memory can also be categorized on the basis of their material:

1.Semiconductor memory:-such as RAM, ROM, EPROM, and flash memory.

2.Magnetic memory:-such as hard disk, floppy disk and magnetic tapes.

3.Optical memory:-such as computer disk, DVD and blue-ray disk.

A **bus** is a collection of parallel wires that form a pathway to carry address, data and control signals.

The **address bus** (sometimes called the memory bus) transports memory addresses which the processor wants to access in order to read or write data. It is a unidirectional bus.

The **Data bus** transfers instructions coming from or going to the processor. It is a bidirectional bus.
Data bus provides a path to transfer data between CPU and memory. The data bus may consist of 32, 64, 128 lines of wire

The **control bus** (or command bus)
Control bus is used to control the access to and the use of the data and address lines

BIOS (Basic Input Output System)

- BIOS is a small chip on the motherboard that holds a set of instructions to load the hardware settings required to activate various devices like keyboards, monitors or disk drives.
- The BIOS runs when the computer is switched ON**.**
- **It performs a Power On Self Test (POST)** that checks if the hardware devices are present and functioning properly.

CMOS (Complementary Metal Oxide Semiconductor)

CMOS is a type of memory chip to store the date, time and system setup parameters. These parameters are loaded every time the computer is started

Chapter:- 6
ENCODING & NUMBER SYSTEM

The mechanism of converting data into an equivalent cipher using specific code is called encoding.

1. American Standard Code for Information Interchange (ASCII)

- ASCII was developed for standardising the character representation.
- ASCII is still the most commonly used coding scheme.
- Initially ASCII used 7 bits to represent characters.
- Total number of different characters on the English keyboard that can be encoded by 7-bit ASCII code is 27 = 128.

ASCII code for some printable characters

Character	Decimal Value	Character	Decimal Value	Character	Decimal Value
Space	32	@	64	`	96
!	33	A	65	a	97
"	34	B	66	b	98
#	35	C	67	c	99
$	36	D	68	d	100
%	37	E	69	e	101
&	38	F	70	f	102
'	39	G	71	g	103
(	40	H	72	h	104
)	41	I	73	i	105

2.Indian Script Code for Information Interchange (ISCII)

- In order to facilitate the use of Indian languages on computers, a common standard for coding Indian scripts called ISCII was developed in India during mid 1980s.
- It is an 8-bit code representation for Indian languages which means it can represent 28=256 characters.
- It retains all 128 ASCII codes and uses rest of the codes (128) for additional Indian language character set.
- Additional codes have been assigned in the upper region (160–255) for the 'aksharas' of the language.

3. UNICODE

- Text created using one encoding scheme was not recognised by another machine using different encoding scheme.
- Therefore, a standard called UNICODE has been developed to incorporate all the characters of every written language of the world.
- UNICODE provides a unique number for every character, irrespective of device (server, desktop, mobile), operating system (Linux, Windows, iOS) or software application (different browsers, text editors, etc.).
- Commonly used UNICODE encodings are UTF-8, UTF-16 and UTF-32.
- It is a superset of ASCII, and the values 0–128 have the same character as in ASCII.
- Unicode characters for Devanagari script

Unicode table for the Devanagari script

◌ 0900	◌ 0901	◌ 0902	: 0903	□ 0904	अ 0905	आ 0906	इ 0907	ई 0908	उ 0909	ऊ 090A	ऋ 090B	ऌ 090C	ऍ 090D	ऎ 090E	ए 090F
ऐ 0910	ऑ 0911	ऒ 0912	ओ 0913	औ 0914	क 0915	ख 0916	ग 0917	घ 0918	ङ 0919	च 091A	छ 091B	ज 091C	झ 091D	ञ 091E	ट 091F
ठ 0920	ड 0921	ढ 0922	ण 0923	त 0924	थ 0925	द 0926	ध 0927	न 0928	ऩ 0929	प 092A	फ 092B	ब 092C	भ 092D	म 092E	य 092F
र 0930	ऱ 0931	ल 0932	ळ 0933	ऴ 0934	व 0935	श 0936	ष 0937	स 0938	ह 0939	◌़ 093A	◌ा 093B	◌ 093C	◌ऽ 093D	◌ा 093E	◌ि 093F
◌ी 0940	◌ु 0941	◌ू 0942	◌ृ 0943	◌ॄ 0944	◌ॅ 0945	◌ॆ 0946	◌े 0947	◌ै 0948	◌ॉ 0949	◌ॊ 094A	◌ो 094B	◌ौ 094C	◌् 094D	◌ॎ 094E	◌ॏ 094F
ॐ 0950	◌॑ 0951	◌॒ 0952	◌॓ 0953	◌॔ 0954	◌ॕ 0955	◌ॖ 0956	◌ॗ 0957	क़ 0958	ख़ 0959	ग़ 095A	ज़ 095B	ड़ 095C	ढ़ 095D	फ़ 095E	य़ 095F
ॠ 0960	ॡ 0961	◌ॢ 0962	◌ॣ 0963	। 0964	॥ 0965	० 0966	१ 0967	२ 0968	३ 0969	४ 096A	५ 096B	६ 096C	७ 096D	८ 096E	९ 096F
॰ 0970	□ 0971	□ 0972	ॲ 0973	ऄ 0974	ऑ 0975	ऒ 0976	ओ 0977	क 0978	ज़ 0979	ड़ 097A	□ 097B	□ 097C	□ 097D	□ 097E	□ 097F

Number System

The Radix or Base is the Number of unique digits, including zero, used to represent number in a positional numeral system. For Example, for the decimal system the Radix is Ten, because it uses the Ten digits from 0 through 9. And that of Binary is Base 2.

Decimal	Binary	Octal	Hexadecimal
0	0000	000	0000
1	0001	001	0001
2	0010	002	0002
3	0011	003	0003
4	0100	004	0004
5	0101	005	0005
6	0110	006	0006
7	0111	007	0007
8	1000	010	0008
9	1001	011	0009
10	1010	012	A
11	1011	013	B
12	1100	014	C
13	1101	015	D
14	1110	016	E
15	1111	017	F

Number systems are systems in mathematics that are used to express numbers in various forms and are understood by computers. A number is a mathematical value used for counting and measuring objects, and for performing arithmetic calculations. Numbers have various categories like natural numbers, whole numbers, rational and irrational numbers, and so on. Similarly, there are various types of number systems that have different properties, like the binary number system, the octal number system, the decimal number system, and the hexadecimal number system.

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What are Number Systems?

A number system is a system representing numbers. It is also called the system of numeration and it defines a set of values to represent a quantity. These numbers are used as digits and the most common ones are 0 and 1, that are used to represent binary numbers. Digits from 0 to 9 are used to represent other types of number systems.

Types of Number Systems

There are different types of number systems in which the four main types are:
Binary number system (Base - 2)
Octal number system (Base - 8)
Decimal number system (Base - 10)
Hexadecimal number system (Base - 16)

Binary Number System

- The binary number system uses only two digits: 0 and 1.
- The numbers in this system have a base of 2.
- Digits 0 and 1 are called bits and 8 bits together make a byte.
- The data in computers is stored in terms of bits and bytes.
- The binary number system does not deal with other numbers such as 2,3,4,5 and so on.
- For example: 10001_2, 111101_2, 1010101_2 are some examples of numbers in the binary number system.

Octal Number System

- The octal number system uses eight digits: 0,1,2,3,4,5,6 and 7 with the base of 8.
- The advantage of this system is that it has lesser digits when compared to several other systems, hence, there would be fewer computational errors.
- Digits like 8 and 9 are not included in the octal number system.
- Just as the binary, the octal number system is used in minicomputers but with digits from 0 to 7.
- For example: 35_8, 23_8, 141_8 are some examples of numbers in the octal number system.

Decimal Number System

- The decimal number system uses ten digits: 0,1,2,3,4,5,6,7,8 and 9 with the base number as 10.
- The decimal number system is the system that we generally use to represent numbers in real life.
- If any number is represented without a base, it means that its base is 10.
- For example: 723_{10}, 32_{10}, 4257_{10} are some examples of numbers in the decimal number system.

Hexadecimal Number System

- The hexadecimal number system uses sixteen digits/alphabets: 0,1,2,3,4,5,6,7,8,9 and A,B,C,D,E,F with the base number as 16.
- Here, A-F of the hexadecimal system means the numbers 10-15 of the decimal number system respectively.
- This system is used in computers to reduce the large-sized strings of the binary system.
- For example: $7B3_{16}$, $6F_{16}$, $4B2A_{16}$ are some examples of numbers in the hexadecimal number system.

Conversions

Binary to Decimal

1) Convert $(1101)_2$ into a decimal number.

$=1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$

$= 8 + 4 + 0 + 1$

$= 13$

Therefore, $(1101)_2 = (13)_{10}$

2) Convert (11001011)2 into a decimal number.

$= (1 \times 2^0) + (1 \times 2^1) + (0 \times 2^2) + (1 \times 2^3) + (0 \times 2^4) + (0 \times 2^5) + (1 \times 2^6) + (1 \times 2^7)$

$= (1 \times 1) + (1 \times 2) + (0 \times 4) + (1 \times 8) + (0 \times 16) + (0 \times 32) + (1 \times 64) + (1 \times 128)$

$= 1 + 2 + 0 + 8 + 0 + 0 + 64 + 128$

$= 203$

Therefore, **(11001011)2= (203)10**

3) Convert (11101111)2 into a decimal number.

11101111 $= (1 \times 2^7) + (1 \times 2^6) + (1 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0)$

$= 128 + 64 + 32 + 0 + 8 + 4 + 2 + 1$

$= 239$

Therefore, binary number 11101111 = 239 decimal number

Octal to Decimal:

1) Convert 22_8 to decimal number.

Solution: Given, 22_8

$2 \times 8^1 + 2 \times 8^0$

$= 16 + 2$

$= 18$

Therefore, $22_8 = 18_{10}$

2: Convert Octal number 2671 to a Decimal number.

$= 2 \times 8^3 + 6 \times 8^2 + 7 \times 8^1 + 1 \times 8^0$

$= 2 \times 512 + 6 \times 64 + 7 \times 8 + 1 \times 1$

$= 1465$

Therefore, (2671)8 = (1465)10

3: Convert Octal number 761.12 to a Decimal number.

Solution:

$= 7 \times 8^2 + 6 \times 8^1 + 1 \times 8^0 + 1 \times 8^{-1} + 2 \times 8^{-2}$

$= 7 \times 64 + 6 \times 8 + 1 \times 1 + 1 \times 1/8 + 2 \times 1/8^2$

$= 448 + 48 + 1 + 0.125 + 0.03125$

$= 497.15625$

Therefore, (761.12)8 = (497.15625)10

4: Convert octal number (121)8 to its decimal form.

$(121)8 = 1 \times 8^2 + 2 \times 8^1 + 1 \times 8^0$

$(121)8 = 1 \times 64 + 2 \times 8 + 1 \times 1$

$(121)8 = 64 + 16 + 1$
Therefore, $(121)8 = (81)10$

Hexadecimal to Decimal:
1) Convert 121_{16} to decimal number.
Solution:
$=1 \times 16^2 + 2 \times 16^1 + 1 \times 16^0$
$= 16 \times 16 + 2 \times 16 + 1 \times 1$
$= 289$
Therefore, $121_{16} = 289_{10}$

2) Convert $(1DA6)_{16}$ to decimal.
Solution:
$(1DA6)_{16}$
Here, 1 = 1, D = 13, A = 10 , 6 = 6
$(1DA6)_{16} = (1 \times 16^3) + (13 \times 16^2) + (10 \times 16^1) + (6 \times 16^0)$
$= (1 \times 4096) + (13 \times 256) + (10 \times 16) + (6 \times 1)$
$= 4096 + 3328 + 160 + 6$
$= 7590$
Therefore, $(1DA6)_{16} = (7590)_{10}$

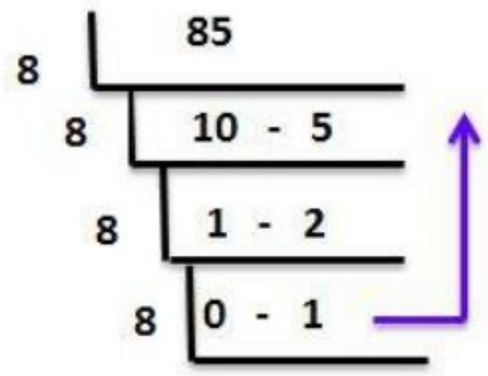
3)Convert $(E8B)_{16}$ to decimal system.
Solution: $(E8B)_{16}$
Here, E = 14, 8 = 8, B = 11.
$(E8B)_{16} = (14 \times 16^2) + (8 \times 16^1) + (11 \times 16^0)$
$= (14 \times 256) + (8 \times 16) + (11 \times 1)$
$= 3584 + 128 + 11$
$= 3723$

Therefore, $(E8B)_{16} = (3723)_{10}$

Binary to Octal

1: Convert 1010101_2 to octal
Solution:
First, we convert given binary to decimal
$1010101_2 = (1 * 2^6) + (0 * 2^5) + (1 * 2^4) + (0 * 2^3) + (1 * 2^2) + (0 * 2^1) + (1 * 2^0)$
$= 64 + 0 + 16 + 0 + 4 + 0 + 1$
$= 64 + 21$
$010101_2 = 85$ (Decimal form)

Now we will convert this decimal to octal form



Therefore, the equivalent octal number is 125_8.

2) **Convert 01101_2 to octal**

Solution:

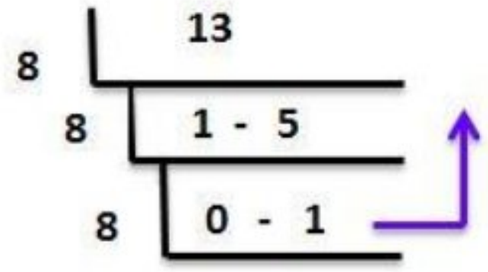
First we convert given binary to decimal

$01101_2 = (0 * 2^4) + (1 * 2^3) + (1 * 2^3) + (0 * 2) + (1 * 2^0)$

$= 0 + 8 + 4 + 0 + 1$

$01101_2 = 13$ (Decimal form)

Now we will convert this decimal to octal form



Therefore, the equivalent octal number is 15_8.

Decimal to Octal

1: Convert $(127)_{10}$ to Octal.

Solution: Divide 127 by 8

$127 \div 8 = 15$(Quotient) and (7)Remainder

Divide 15 by 8 again.

$15 \div 8 = 1$(Quotient) and (7) Remainder

Divide 1 by 8, we get;

$1 \div 8 = 0$(Quotient) and (1) Remainder

Hence, $(127)_{10} = (177)_8$

2: Convert 52_{10} to octal.

Solution: Divide 52 by 8

$52 \div 8 = 6$(Quotient) and (4)Remainder

Divide 6 by 8 again.

$6 \div 8 = 0$(Quotient) and (6) Remainder

Hence, $(52)_{10} = (64)_8$

3: Convert 100_{10} to octal.

Solution: Divide 100 by 8

$100 \div 8 = 12$(Quotient) and (4)Remainder

Divide 12 by 8 again.

$12 \div 8 = 1$(Quotient) and (4) Remainder

Divide 1 by 8, we get;

$1 \div 8 = 0$(Quotient) and (1) Remainder

Hence, $(100)_{10} = (144)_8$

Binary to Hexadecimal

Convert binary number 1101010 into hexadecimal number.

First convert this into decimal number:

$= (1101010)_2$

$= 1x2^6+1x2^5+0x2^4+1x2^3+0x2^2+1x2^1+0x2^0$

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

$= (106)_{10}$

Then, convert it into hexadecimal number

$= (106)_{10}$

$= 6x16^1+10x16^0$

$= (6A)_{16}$ which is answer.

Computer Network Concept & Communication

Different types of network are: LAN, MAN and WAN.

LAN (local area network)

- A **LAN (local area network)** is a group of computers and network devices connected together, usually within the same building. By definition, the connections must be high speed and relatively inexpensive (e.g., token ring or Ethernet).
- Local Area Network connects network devices in such a way that personal computers and workstations can share data, tools, and programs.
- speeds are normally 100 or 1000 Mbps.
- LAN has a range up to 2km.
- The smallest LAN may only use two computers, while larger LANs can accommodate thousands of computers.
- Provides fast data transfer rates and high-speed communication.
- Easy to set up and manage.
- Can be used to share peripheral devices such as printers and scanners.
- Provides increased security and fault tolerance compared to WANs.
- Limited geographical coverage.

MAN (metropolitan area network)

- A **MAN (metropolitan area network)** is a larger network that usually spans several buildings in the same city or town.
- Metropolitan area Network covers a larger area than that covered by a LAN and a smaller area as compared to WAN
- MAN has a range of 5-50km.
- It covers a large geographical area and may serve as an ISP (Internet Service Provider).
- MAN is designed for customers who need high-speed connectivity.
- Offers higher data transfer rates than WAN in some cases.
- Can be expensive to set up and maintain.

WAN (wide area network)

- A **WAN (wide area network)**, in comparison to a MAN, is not restricted to a geographical location, although it might be confined within the bounds of a state or country.
- A WAN connects several LANs, and may be limited to an enterprise (a corporation or an organization) or accessible to the public.
- The technology is high speed and relatively expensive.
- WAN is difficult to design and maintain.
- Covers large geographical areas and can connect remote locations.
- Provides connectivity to the internet.
- Offers remote access to resources and applications.
- Can be used to support multiple users and applications simultaneously.
- Can be expensive to set up and maintain.
- Offers slower data transfer rates than LAN or MAN
- The Internet is an example of a worldwide public WAN.

PAN (Personal Area Network)

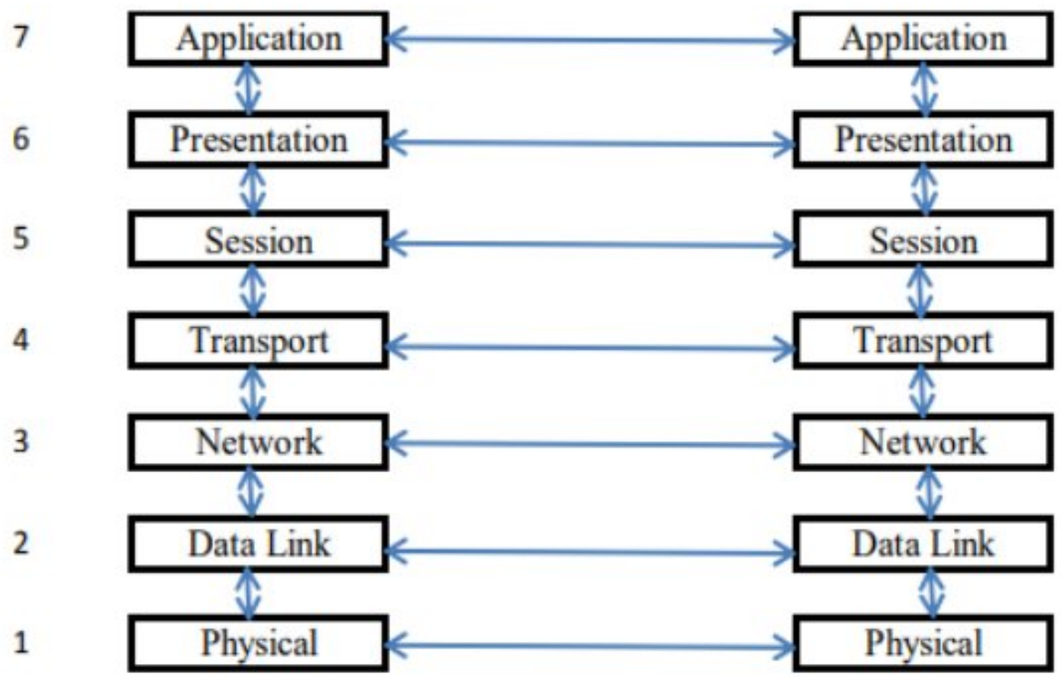
- A **personal area network (PAN)** is a computer network used for data transmission amongst devices such as computers, telephones, tablets and personal digital assistants.
- PAN is a personal area network having an interconnection of personal technology devices to communicate over a short distance.
- It covers only less than 10 meters or 33 feet of area.
- PAN has fewer users as compared to other networks such as LAN, WAN, etc.
- Can be set up easily and quickly.
- Uses wireless technology, which eliminates the need for wires and cables.
- Limited coverage area.

Virtual private network (VPN)

- A **virtual private network (VPN)** extends a private network across a public network, such as the Internet.
- It enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network.
- A virtual private network (VPN) is a technology that creates a safe and encrypted connection over a less secure network, such as the Internet.
- user can be part of a local network sitting at a remote location. It makes use of tunneling protocols to establish a secure connection.

Network	Speed	Range
LAN	100-1000mbps	1-5 KM
WAN	10 -20 mbps	100-1000 KM
MAN	100mbps	5 – 50 Km
PAN	1mbps	10 Meters

OSI Model (Open System Interconnection)



The Physical Layer

The physical layer is concerned with transmitting raw bits over a communication channel. It also deals with mechanical, electrical and timing interfaces.

The Data Link Layer

The main function of the data link layer is to transform a raw transmission facility into a line that appears free of undetected transmission errors to the network layer.

The Network Layer

The network layer controls the operation of the subnet. The main function is to determine how packets are routed from source to destination.

The Transport Layer

The basic function of transport layer is to accept data from above layer and split it up into smaller units if needed, and pass these to the network layer and ensure that the pieces all arrive correctly at the other end. It also determines type of services to provide to the session layer.

The Session Layer

The session layer allows users on different machines to establish sessions between them. It includes dialog control, token management and synchronization.

The Presentation Layer

- The presentation layer concerned with the syntax and semantics of the information transmitted concerned with moving bits around the layer.
- This layer is responsible for encryption of data.

The Application Layer

The application layer contains a variety of protocols that are commonly needed by the user. For example, HTTP (Hyper Text Transfer Protocol) which is the bases for the World Wide Web (WWW) to access

TCP/IP (Transmission Control Protocol/Internet Protocol):-

- TCP/IP is a layered set of protocols. This protocol assumes that there is a way to communicate reliably between the two computers.
- TCP/IP is the base communication protocol of the internet.

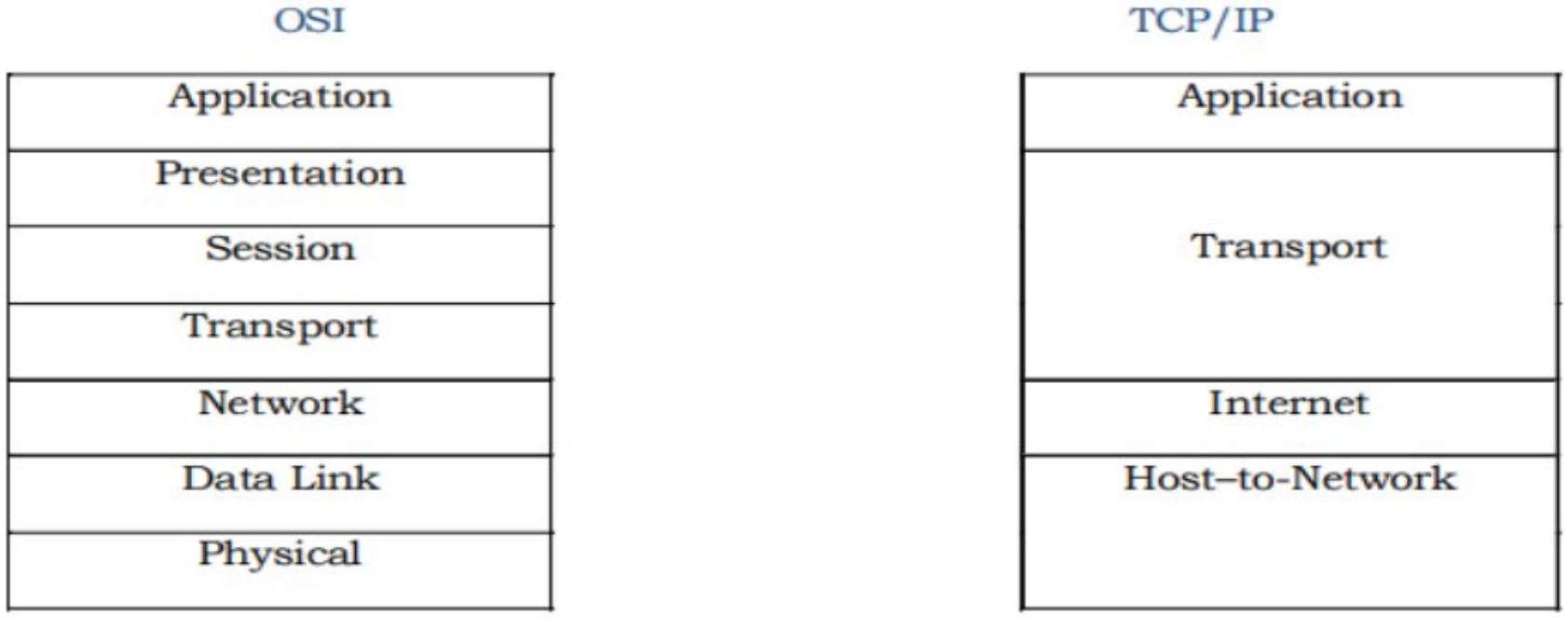
Data Gram:-

A data gram is a unit of data, which is what the protocols deal with.

Packets:-

- A packet is a physical thing, appearing on an Ethernet or some wire.
- Internet Uses Packet Switching Technology.

OSI & TCP/IP Model Layers



HTTP (Hypertext Transfer Protocol)

- The Hypertext Transfer Protocol (HTTP) is an application-level protocol with the lightness and speed necessary for distributed, collaborative, hypermedia information systems.
- HTTP allows an open-ended set of methods to be used to indicate the purpose of a request. It builds on the discipline of reference provided by the Uniform Resource Identifier (URI), as a location URL or name (URN) for indicating the resource on which a method is to be applied.
- Messages are passed to HTTP in a format similar to that used by internet mail and Multipurpose Internet Mail Extensions (MIME).

FTP (File Transfer Protocol)

- One of the original services on the internet was designed to allow for transferring files from one system to another.
- Files of any type can be transferred, although you may have to specify whether the file is an ASCII or Binary file.
- They can be transferred to any system on the internet provided that the permissions are set accordingly.
- It is very useful to transfer the files from one network to another.

- It is an effective way to get a geographically dispersed group to co-operate on a project.
- It is popular way to share information over the internet. FTP works as a client/server process.
- FTP (File Transfer Protocol) operates at the **Application Layer** of the OSI model.

SLIP/PPP (Serial Line Internet Protocol)

- Serial line IP (SLIP) was the first protocol for relaying the IP packets over dial-up lines.
- It defines an encapsulation mechanism, with little ease.
- There is no support for dynamic address assignment, link testing or multiplexing different protocols over a single link.
- SLIP has been largely supplanted by PPP.

PPP (Point to Point Protocols)

- PPP is the internet standard for transmission of IP packets over serial lines.
- The IP Control Protocol (IPCP), permits the transport of IP packets over a PPP link.
- PPP supports both synchronized and unsynchronized lines.

Networking Devices

Modem:

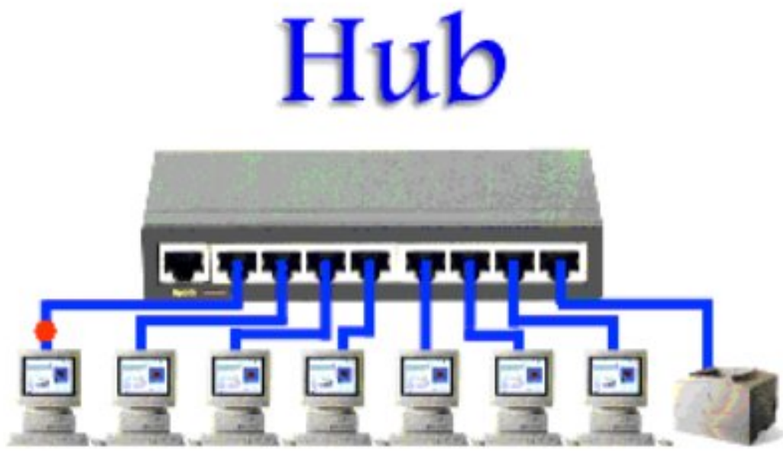
Modem stands for Modulator-Demodulator.

It isused to connect computers for communication via telephone lines.

1. **Internal modems:** The modems that are fixed within the computer.
2. **External modems:** The modems that are connected externally to a computer as other peripherals are connected.

Hub:

- A hub is a hardware device used to connect several computers together.
- A hub that contains multiple independent but connected modules of network and internetworked equipment.
- A concentrator is a device that provides a central connection point for cables from workstations, servers and peripherals.
- It works at the Physical layer.
- It just acts like aconnector of several computers i.e. simply connects all the devices on its ports together.
- It broadcasts all the datapackets arriving at it with no filtering capacity.

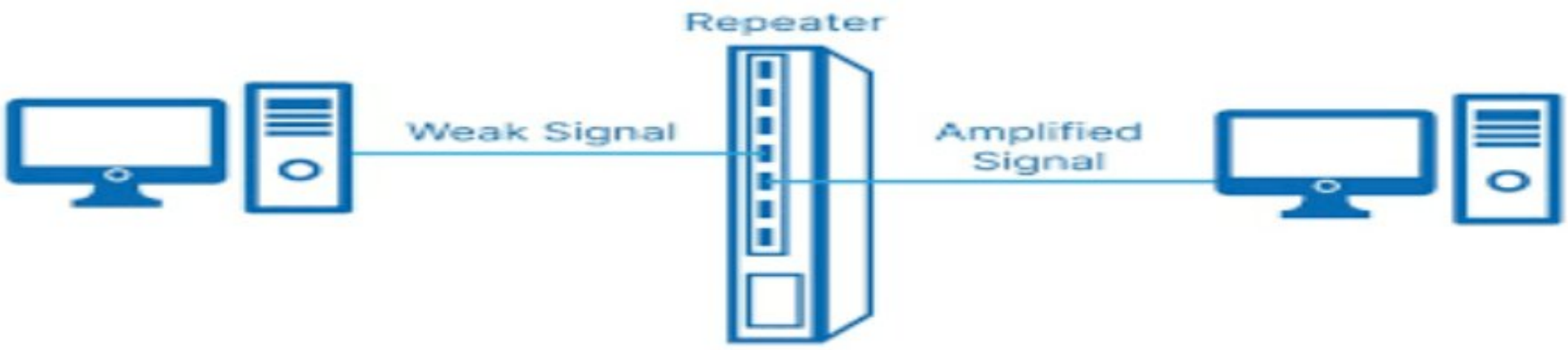


Switch:

- It works at the Data Link Layer.
- It is used for dividing a network into segments called subnets.
- It providesfiltering of data packets and prevents network traffic also.
- A switch is responsible for filtering i.e., transforming data in a specific way and for forwarding packets (a piece of message being transmitted) between LAN segments. Switch support any packets protocol.
- LANs that are segmented through switches are called switched LANs. In the case of Ethernet LANs, they are called switched Ethernet LANs.

Repeater:

- It operates at the Physical Layer.
- It is used to amplify a signal that has lost its original strength so as to enable them to travel long distances.
- It is used in long network lines, which exceed the maximum rated distance for a single run.

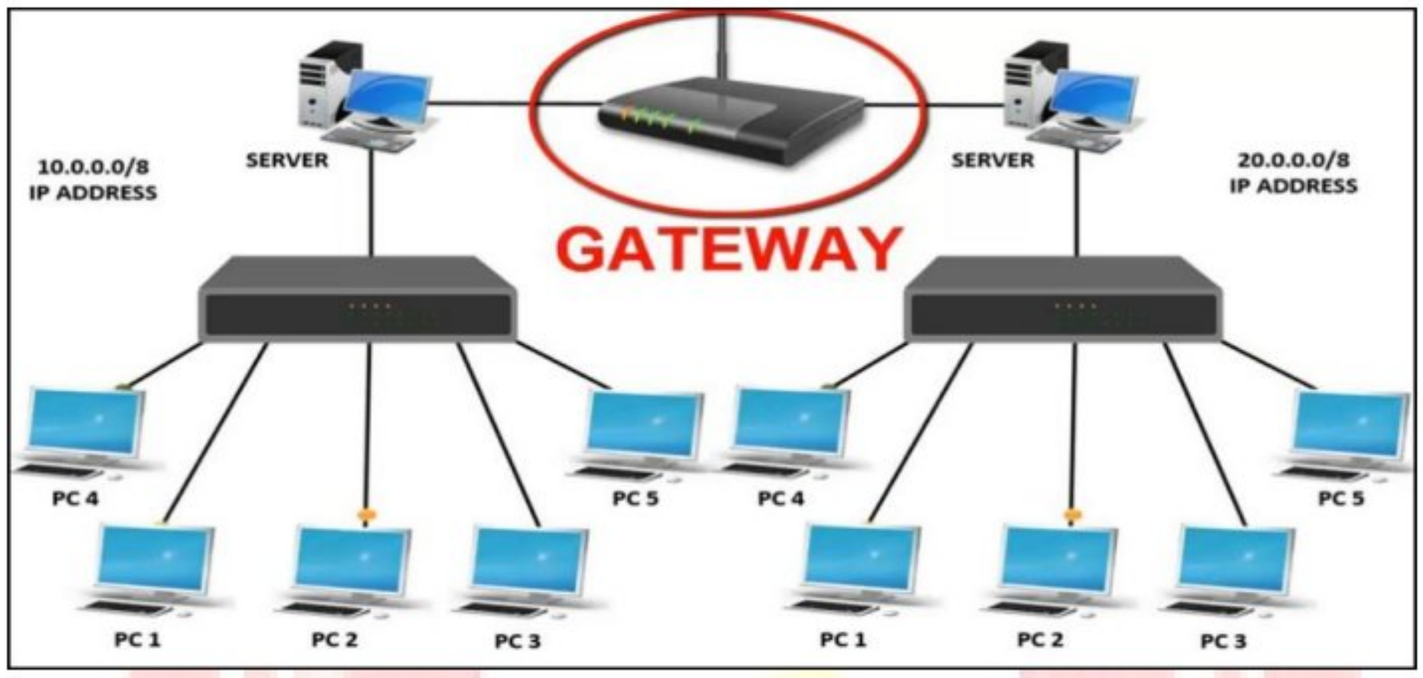


Router:

- A device that works like a bridge but can handle different protocols is known as a router.
- For example, a router can link Ethernet to a mainframe.
- It works at the Network Layer and is used to connect different networks that have different architectures and protocols.
- It sends the data packets to desired destination by choosing the best path available thus reducingnetwork traffic.

Gateway:

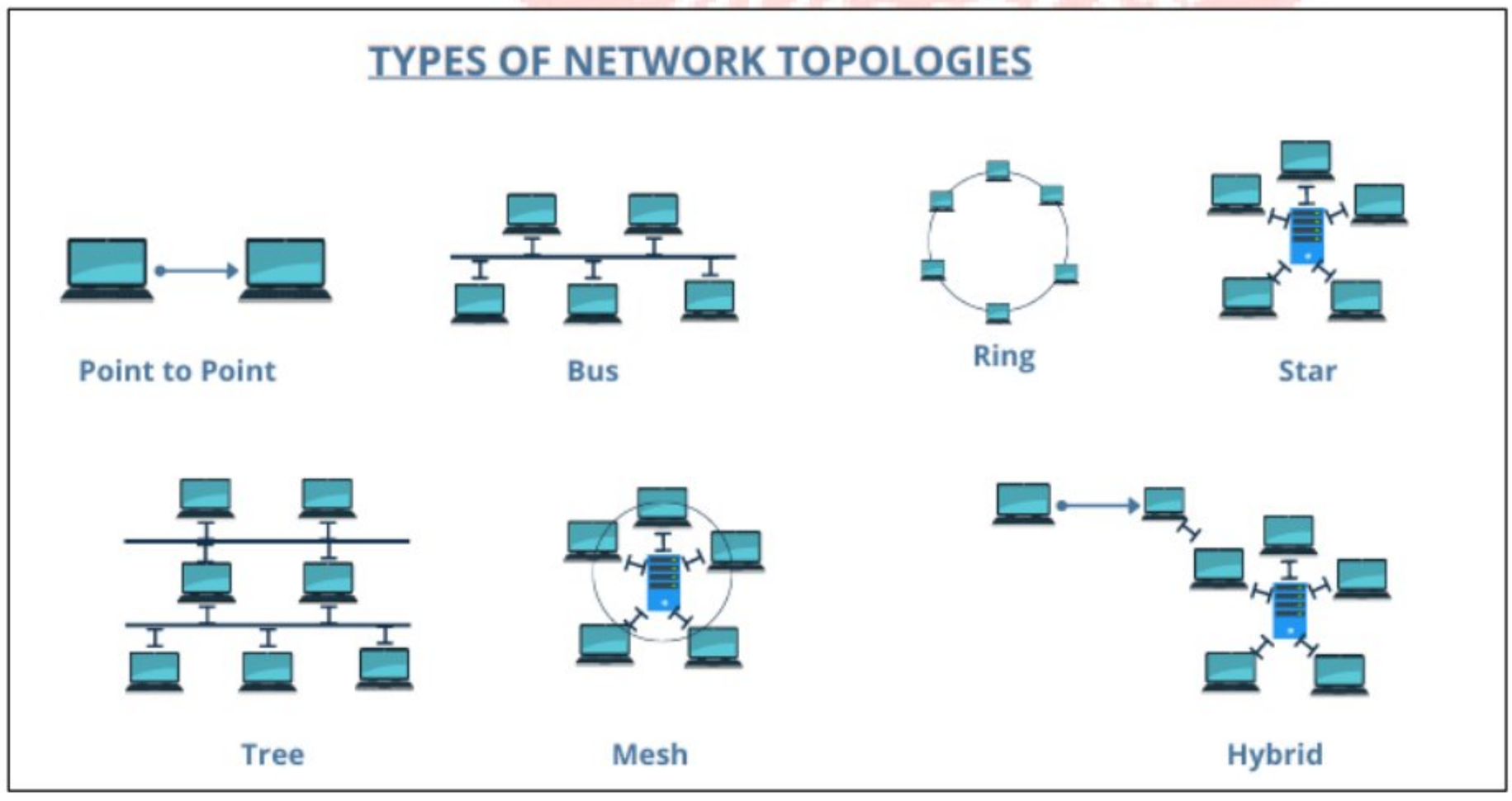
- It operates in all the layers of the network architecture.
- A Gateway is a device that connects dissimilar networks.
- It expands the functionality of routers by performing data translation and protocol conversion.
- It is needed to convert Ethernet traffic from the LAN, to SNA (Systems Network Architecture) traffic on a legacy system.
- It can be used to connect two different networks having different architectures, environment and even models.



Bridge:

- They are used two connect two LANs with the same standard but using different types of cables.
- It provides an intelligent connection by allowing only desired messages to cross the bridge thus improving performance.
- It uses physical addresses of the packets for this decision.

Network Topology



BUS Topology

Bus topology is a type of network in which each computer and network device is joined to a single cable.
When it consists of exactly two endpoints, then it is called Linear Bus topology.

Features of BUS Topology

- It sends data only in one direction.
- Every device is linked to a single cable.
- Cost-effective.
- Cable requirement is minimal as compared to other topologies.
- Useful in small networks.
- Easy to understand.
- Easy to expand by connecting two cables.
- The whole network fails if cables fail.
- The performance of the network decreases in case network traffic is heavy or nodes are more or the cable has a limited length.
- It works slower as compared to the ring topology.

RING Topology

It is named ring topology because it creates a ring as each computer is linked to the neighbouring computer, with the last one linked to the first, there are exactly two neighbours for each computer.

- The transmission is in one direction, but it is possible to implement bidirectional transmission by having 2 connections between each Network Node, therefore also known as "Dual Ring Topology".
- Data is transmitted in a sequential manner that is bit by bit. Data transmitted, has to go through each node linked in the network, till the final node.
- Transmitting network is not affected by huge traffic or by the addition of more nodes, as only the nodes having tokens (short message) are allowed to transmit data.
- Low cost to install and expand.
- Troubleshooting is not simple in a ring topology.
- The addition or removal of the computers interferes with the other nodes and network activity.
- The crashing of one node affects the whole network.
- Initial installation cost is high therefore not applied at low-density traffic.

STAR Topology

In Star Topology all the nodes are linked to a common hub via a cable.
This hub is the central node and all other nodes are linked to the central node.
Unlike Mesh topology, star topology does not permit straightforward communication between the devices, a device needs to communicate through the hub.

Features of STAR Topology

- Each node has its unique connection to the hub.
- Hub works as a repeater for data transmission.
- Can be utilized with twisted pair, Optical Fibre, or coaxial cable.
- Speedy performance with less number of nodes and low network traffic.

- Hub can be easily upgraded without hassle.
- Simpler to troubleshoot.
- Simpler to set up and modify.
- Expensive to install.
- Expensive in usage.

MESH Topology

In a mesh topology, every device is correlated to every other device on the network by a dedicated point-to-point connection.
Mesh consists of n(n-1)/2 physical channels to link n number of devices.

Features of MESH Topology

- Fully lined.
- Not flexible.
- Each connection may carry its unique data load.
- It is robust.
- Fault can be diagnosed easily.
- Facilitates security and privacy.
- Installation and configuration are not simple.
- Cabling cost is higher.
- Bulk wiring is needed.

TREE Topology

It has a root node and all other nodes are linked to it creating a hierarchy. It is also called "hierarchical topology".
It must have a minimum of three levels to the hierarchy.

Features of TREE Topology

- Ideal if workstations are situated in groups.
- Useful in Wide Area Network.
- Extension of bus and star topologies.
- Expansion of nodes is possible and easy.
- Easily managed and maintained.
- Error detection is easily done.
- Heavily cabled.
- Costly.
- If additional nodes are introduced, maintenance is difficult.
- If the central hub fails, the network fails.

HYBRID Topology

It is two different kinds of topologies, which is a combination of two or more topologies.

Features of HYBRID Topology

- It is an encapsulation of two or topologies
- Inherits the benefits and disadvantages of the topologies included.
- Reliable because Error detecting and troubleshooting are easy.
- Effective.
- Scalable as size can be increased easily.
- Flexible.
- Complex in design.
- Costly.

Data Communication

Data Communication deals with the transmission of digital data from one device to another. Data is transferred throughga pathway called as communication channel which can be physical wire connecting the devices or may be unguided media like laser, microwave etc.

A communication channel has a source or transmitter at oneside and a designation or receiver at another side of the network.

The effectiveness of a data communications system depends on four fundamental characteristics: **delivery, accuracy, timeliness, and jitter.**

1. **Delivery:-** The system must deliver data to the correct destination. Data must be received by the intended device or user and only by that device or user.

2. **Accuracy:-** The system must deliver the data accurately. Data that have been altered in transmission and left uncorrected are unusable.

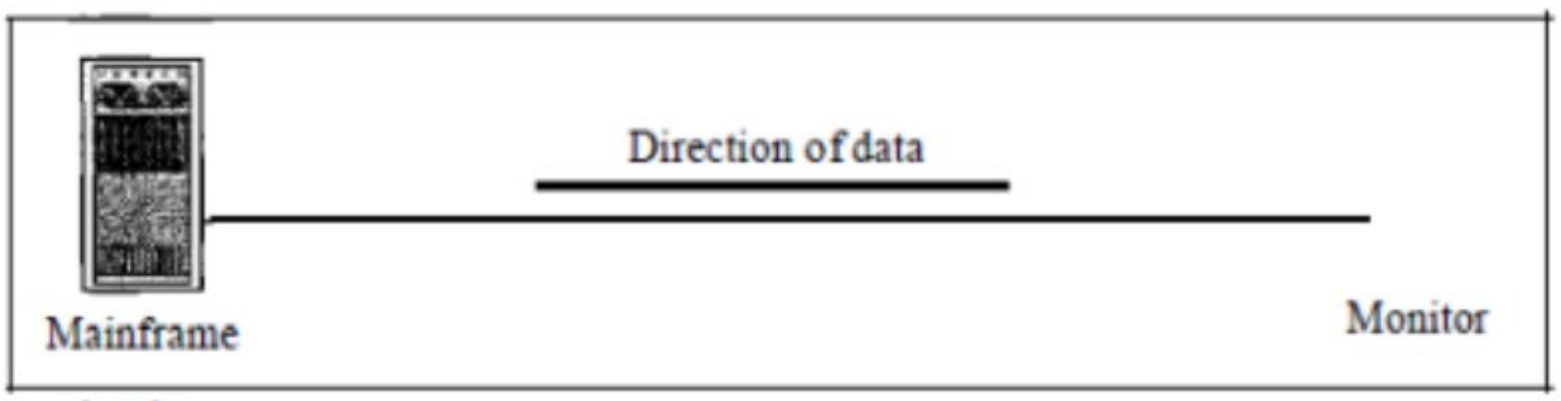
3. **Timeliness:-** The system must deliver data in a timely manner. Data delivered late are useless. In the case of video and audio, timely delivery means delivering data as they are produced, in the same order that they are produced, and without significant delay. This kind of delivery is called real-time transmission.

4. **Jitter :-**Jitter refers to the variation in the packet arrival time. It is the uneven delay in the delivery of audio or video packets.

Communication Channels

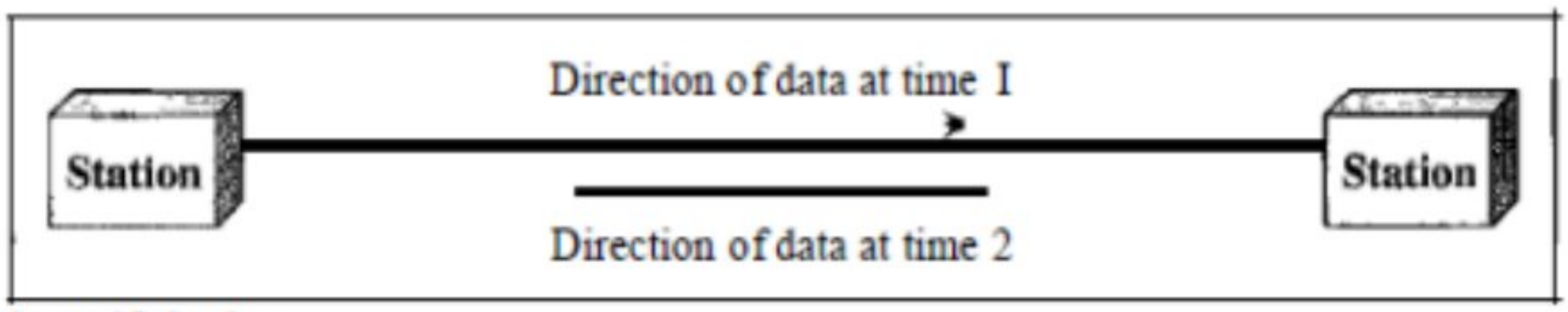
The source of data origination is single but there may be multiple receivers. A communication channel is of 3types:

Simplex: This, communication is unidirectional i.e. one of the two devices can transmit the data and the other can onlyreceive the data. For **e.g. Radio broadcasting, television broadcasting etc.**



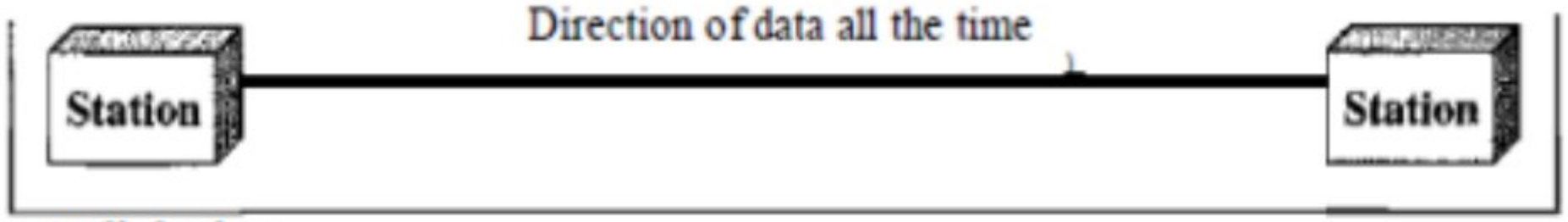
a. Simplex

Half duplex: This communication is bidirectional. Either of the devices can act as transmitter or receiver but only one device can transmit the data at one time. For **e.g. Walkie-Talkie.**



b. Half-duplex

Full Duplex: Here the communication is in both directions and both the devices can simultaneously transmit the data.For **e.g. Telephone Conversation.**



c. Full-duplex

Chapter :-8
Cloud Computing

What is Cloud?

The term Cloud refers to a Network or Internet. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over network, i.e., on public networks or on private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, customer relationship management (CRM),all run in cloud.

What is Cloud Computing?

Cloud Computing refers to manipulating, configuring, and accessing the applications online. It offers online data storage, infrastructure and application.

Cloud Computing Architecture

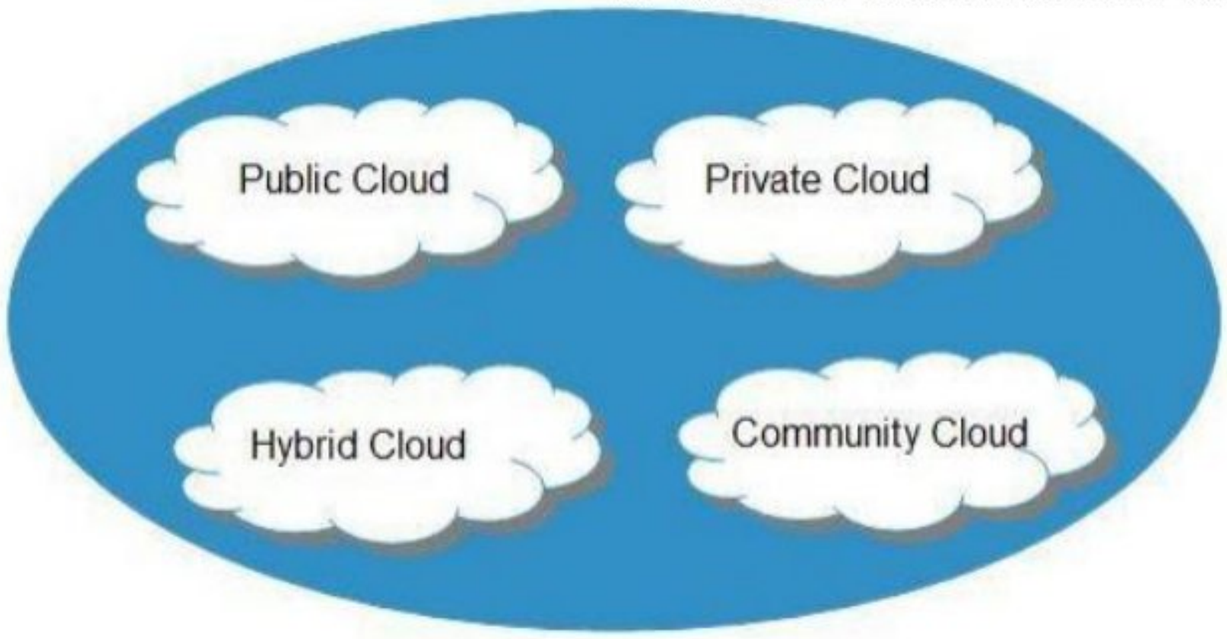
Basic Concepts

There are certain services and models working behind the scene making the cloud computing feasible and accessible to end users. Following are the working models for cloud computing:

- Deployment Models
- Service Models

DEPLOYMENT MODELS

Deployment models define the type of access to the cloud, i.e., how the cloud is located? Cloud can have any of the four types of access: Public, Private, Hybrid and Community.



PUBLIC CLOUD :-

- The Public Cloud allows systems and services to be easily accessible to the general public.
- Public cloud may be less secure because of its openness, e.g., e-mail.

PRIVATE CLOUD :-

- The Private Cloud allows systems and services to be accessible within an organization.
- It offers increased security because of its private nature.

COMMUNITY CLOUD :-

- The Community Cloud allows systems and services to be accessible by group of organizations.

HYBRID CLOUD :-

- The Hybrid Cloud is mixture of public and private cloud. However, the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

Benefits :-

Cloud Computing has numerous advantages. Some of them are listed below:

- One can access applications as utilities, over the Internet.
- Manipulate and configure the application online at any time.
- It does not require to install a specific piece of software to access or manipulate cloud application.
- Cloud Computing offers online development and deployment tools, programming runtime environment through Platform as a Service model.
- Cloud resources are available over the network in a manner that provides platform independent access to any type of clients.
- Cloud Computing offers on-demand self-service. The resources can be used without interaction with cloud service provider.
- Cloud Computing is highly cost effective because it operates at higher efficiencies with greater utilization. It just requires an Internet connection.
- Cloud Computing offers load balancing that makes it more reliable.

Applications of Cloud Computing

1. Online data Storage
2. Backup and Recovery
3. Big data Analysis
4. Testing and Development
5. Antivirus application
6. E-Commerce Application

Cloud Service Model:-

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)
- Communication-as-a-Service (CaaS)
- Monitoring-as-a-Service (MaaS)

1. SaaS(Software as a service): Required software, Operating system & network is provided.
2. PaaS(Platform as service): Operating system and network is provided.
3. IaaS(Infrastructure as a service): just Network is provided.

Advantages of Cloud:-

1. Lower computer costs
2. Improved performance:
3. Reduced software costs
4. Instant software updates
5. Improved document format compatibility
6. Unlimited storage capacity
7. Increased data reliability
8. Universal document access
9. Latest version availability
10. Easier group collaboration
11. Device independence

Disadvantages of Cloud:-

1. Requires a constant Internet connection.
2. Does not work well with low-speed connections .
3. Features might be limited.
4. It Can be slow.
5. Sometime Stored data can be lost.
6. Stored data might not be secure

E-Mail

Electronic mail, commonly shortened to "email," is a communication method that uses electronic devices to deliver messages across computer networks. "Email" refers to both the delivery system and individual messages that are sent and received.

How does email work?

- The sender's mail server, also called a Mail Transfer Agent (MTA), initiates a **Simple Mail Transfer Protocol (SMTP)** connection.
- The SMTP checks the email envelope data — the text that tells the server where to send a message for the recipient's email address, then uses the **Domain Name System (DNS)** to translate the domain name into an IP address.
- The SMTP looks for a **mail exchange (MX)** server associated with the recipient's domain name. If one exists, the email is forwarded to the recipient's mail server.
- The **'Date'** field contains the date the email is sent. This is a mandatory header field.
- The **'From'** field contains the email address of the sender. If the email address is associated with a display name, that may be shown in this field as well. This is also a mandatory header field.
- The **'To'** field contains the email address of the recipient. If the email address is associated with a display name, that may be shown in this field as well.
- The **'Subject'** field contains any contextual information about the message the sender wants to include. It is displayed as a separate line above the body of an email.
- The **'Cc' (carbon copy)** field allows the sender to send a copy of the email to additional recipients. The recipients marked in the 'To' field can see the email address listed in the 'Cc' field.
- The **'Bcc' (blind carbon copy)** field allows the sender to send a copy of the email to additional recipients. The recipients marked in the 'To' field cannot see the email address listed in the 'Bcc' field.
- Email is used for exchanging message via electronic device.
- Invited by Ray Tomlinson in 1971.
- @ is used to separate the username and ISP (Internet service Provider).
- A good Password must contains Alphanumeric , case sensitive and Special Symbols.
- Example: **Email : Username@gmail.com**

Chapter :-9
Internet & Computer Security

The **Internet** is a global system of interconnected computernetworks that use the standard Internet protocol suite (TCP/IP) to link several billion devices worldwide.

It is a **network of networks** that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broadarray of electronic, wireless, and optical networking technologies.

ARPANET

- It was first used in 1969 and finally decommissioned in 1989.
- The Advanced Research Projects Agency Network (ARPANET) was one of the world's first operational packet switching networks, the first network to implement TCP/IP, and the progenitor of what was to become the global Internet.
- The network was initially founded by the Advanced Research Projects Agency (ARPA, later DARPA) within the U.S. Department of Defense for use by its projects at universities and research laboratories in the US.

ARPANET adopted TCP/IP in 1983, and from there researchers began to assemble the "network of networks" that became the modern Internet.

WWW:-

The **World Wide Web** (abbreviated as WWW or W3, commonly known as the Web) is a system of interlinked hypertext documents that are accessed via the Internet.

- In September 1994, Berners-Lee founded the World Wide Web.
- The World Wide Web consists of all the public Web sites connected to the Internet worldwide, including the client devices (such as computers and cell phones) that access Web content.

Website:-

- A **Website** is a set of related web pages served from a single web domain.

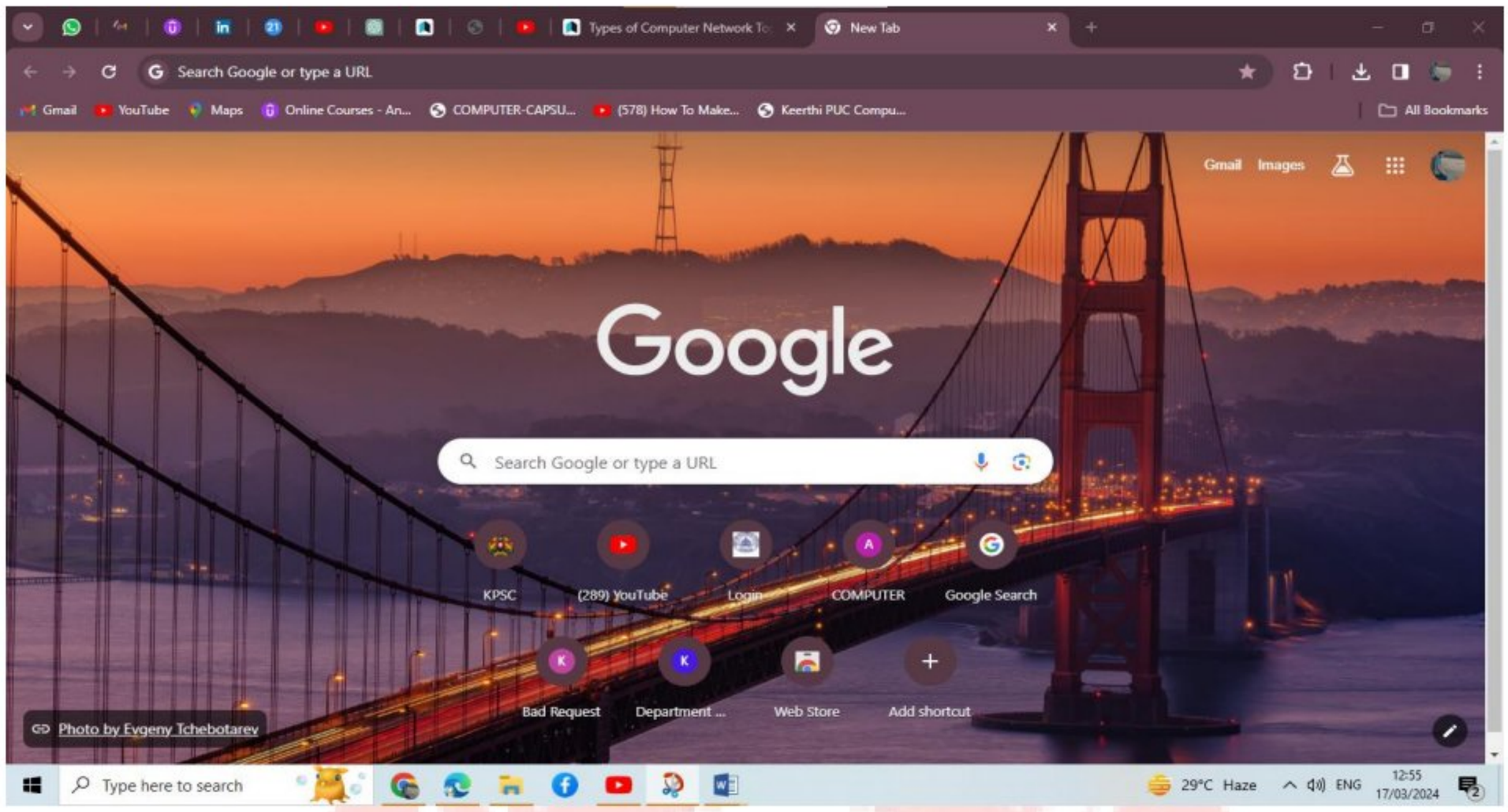
A **Home page, index page,** or **main page** is a page on a website. A home page usually refers to:

- The initial or main web page of a website, sometimes called the "front page" (by analogy with newspapers).
- The first page that appears upon opening a web browser program, which is also sometimes called the start page. This 'start page' can be a website or it can be a page withvarious browser functions such as the visual display of websites that are often visited in the web browser.
- The web page or local file that automatically loads when aweb browser starts or when the browser's "home" button is pressed; this is also called a "home page". The user canspecify the URL of the page to be loaded, or alternativelychoose e.g. to re-load the most recent web page browsed.

A **Hyperlink** is a reference to data that the reader can directly follow either by clicking or by hovering or that is followed automatically

A **web browser** (commonly referred to as a browser) is a software application for retrieving, presenting

and traversing information resources on the World Wide Web.



- The first web browser was invented in 1990 by Sir Tim Berners-Lee. It was called Worldwide Web (no spaces) and was later renamed Nexus.
- browser (commonly referred to as a browser) is a software application for retrieving, pre-setting and traversing information resources on the World Wide Web.
- Hyperlinks present in resources enable users easily to navigate their browsers to related resources.
- A web browser can also be defined as an application software or program designed to enable users to access, retrieve and view documents and other resources on the Internet.

Some of the famous browsers are

List of Top 10 Browsers

- Firefox.
- Google Chrome.
- Microsoft Edge.
- Apple Safari.
- Opera.
- Brave.
- Vivaldi.
- DuckDuckgo.
- Chromium
- Epic

URL:-

The **Uniform Resource Locator**, abbreviated as URL is a specific character string that constitutes a reference to a resource.

- In most web browsers, the URL of a web page is displayed on top inside an address bar.

An example of a typical URL would be"http://www.AceExamMinds.com".

Here the **domain name** is 'AceExamsMinds.com' **Downloading** mean store receive data to a local system from a remote system or to initiate such a data transfer

Uploading refers to the sending of data from a local system to a remote system such as a server or another client with the intent that the remote system should store a copy of the data being transferred.

An **Internet Protocol address** (also known as an **IP address**) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network. It acts as an identifier for a computer. It is a unique address for every computer.

Domain name system

- It is a Symbolic String associated with an IP address.
- The Domain Name System (DNS) is a hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network.
- It associates various information with domain names assigned to each of the participating entities.

Domain	Discription
.com	commercial
.edu	educational
.gov	government
.int	international organizations
.mil	United States Military
.net	network
.org	organization
.aero	air-transport industry
.biz	business
.cat	Catalan
.cam	entertainment
.coop	cooperatives
.info	information
.jobs	companies

Search Engines

- A web search engine is software code that is designed to search for information on the World Wide Web.
- The search results are generally presented in a line of results often referred to as Search Engine Results Pages (SERPs).

- Google
- Bing
- Yahoo!
- Yandex
- DuckDuckGo
- Baidu
- Ask.com
- Naver
- Ecosia
- AOL
- Internet Archive

Ethernet

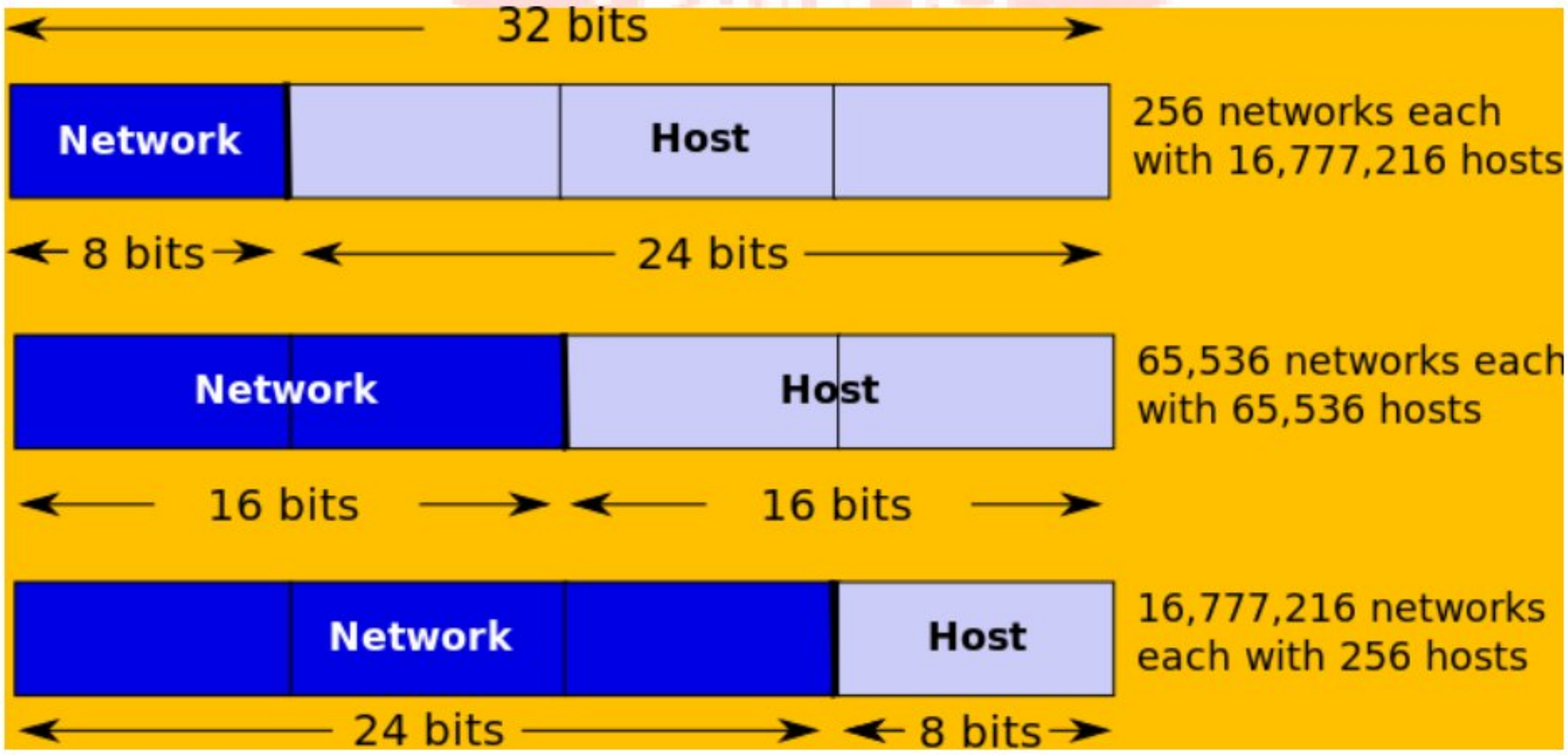
Ethernet is the traditional technology for connecting devices in a wired local area network (LAN) or wide area network. It enables devices to communicate with each other via a protocol, which is a set of rules or common network language.

Advantages of Ethernet

- Relatively low cost.
- Backward compatibility.
- Generally resistant to noise.
- Good data transfer quality.
- Speed.
- Reliability.
- Data security, as common firewalls can be used.

IP Address

An IP address is a string of numbers separated by periods. IP addresses are expressed as a set of four numbers — an example address might be 192.158.1.38. Each number in the set can range from 0 to 255. So, the full IP addressing range goes from 0.0.0.0 to 255.255.255.255.



IPV4

IP stands for **Internet Protocol** and **v4** stands for **Version Four** (IPv4). IPv4 was the primary version brought into action for production within the ARPANET in 1983.
IP version four addresses are 32-bit integers which will be expressed in decimal notation.
Example- 192.0.2.126 could be an IPv4 address.

Parts of IPv4

- **Network part:**
  The network part indicates the distinctive variety that's appointed to the network. The network part conjointly identifies the category of the network that's assigned.
- **Host Part:**
  The host part uniquely identifies the machine on your network. This part of the IPv4 address is assigned to every host.
  For each host on the network, the network part is the same, however, the host half must vary.
- **Subnet number:**
  This is the non obligatory part of IPv4. Local networks that have massive numbers of hosts are divided into subnets and subnet numbers are appointed to that.
-

Characteristics of IPv4

- IPv4 could be a 32-Bit IP Address.
- IPv4 could be a numeric address, and its bits are separated by a dot.
- The number of header fields is twelve and the length of the header field is twenty.
- It has Unicast, broadcast, and multicast style of addresses.
- IPv4 supports VLSM (Virtual Length Subnet Mask).
- IPv4 uses the Post Address Resolution Protocol to map to the MAC address.
- RIP may be a routing protocol supported by the routed daemon.
- Networks ought to be designed either manually or with DHCP.
- Packet fragmentation permits from routers and causing host.

IPv6	IPv4
IPv6 has a 128-bit address length	IPv4 has a 32-bit address length
It supports Auto and renumbering address configuration	It Supports Manual and DHCP address configuration
The address space of IPv6 is quite large it can produce 3.4×1038 address space	It can generate 4.29×109 address space
Address Representation of IPv6 is in hexadecimal	Address representation of IPv4 is in decimal
In IPv6 checksum field is not available	In IPv4 checksum field is available

IPv6	IPv4
IPv6 has a header of 40 bytes fixed	IPv4 has a header of 20-60 bytes.
IPv6 does not support VLSM.	IPv4 supports VLSM(Variable Length subnet mask).

Computer Security

PROTECTION METHODS

Authorization

It 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. Authorization is performed by asking the user a legal login ID. If the user is able to provide a legal login ID, he/she is considered an authorized user.

Authentication

It 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.

Authentication also termed as password protection as the authorized user is asked to provide a valid password and if he or she is able to do this, he or she considered to be an authentic user.

Encrypted Smart Cards:

- Passwords in a remote login session generally pass over the network in unencrypted form; any hacker can simply record it and can use it later maliciously to corrupt data/files or to harm anyone etc.
- To counter such threats newer approaches are suggested such as encrypted smart cards.
- An encrypted smart card is a hand held smart card that can generate a token that a computer system can recognize.
- Every time a new and different token is generated, which even though cracked or hacked, cannot be used later.

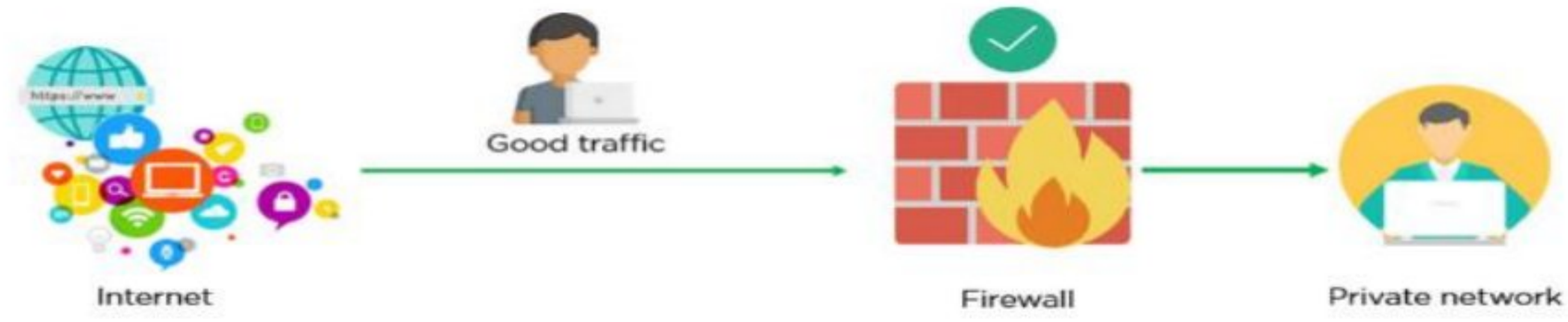
Bio Metric Systems:

They form the most secure level of authorization. The Biometric systems involve some unique aspects of a person's body such as finger prints, retinal patterns, etc to establish his/her identity.

Firewall

- It is a Network Security Device that monitor income & outgoing network traffic and decide whether to allow or block specific traffic based on a defined set of security rules.

Good Traffic

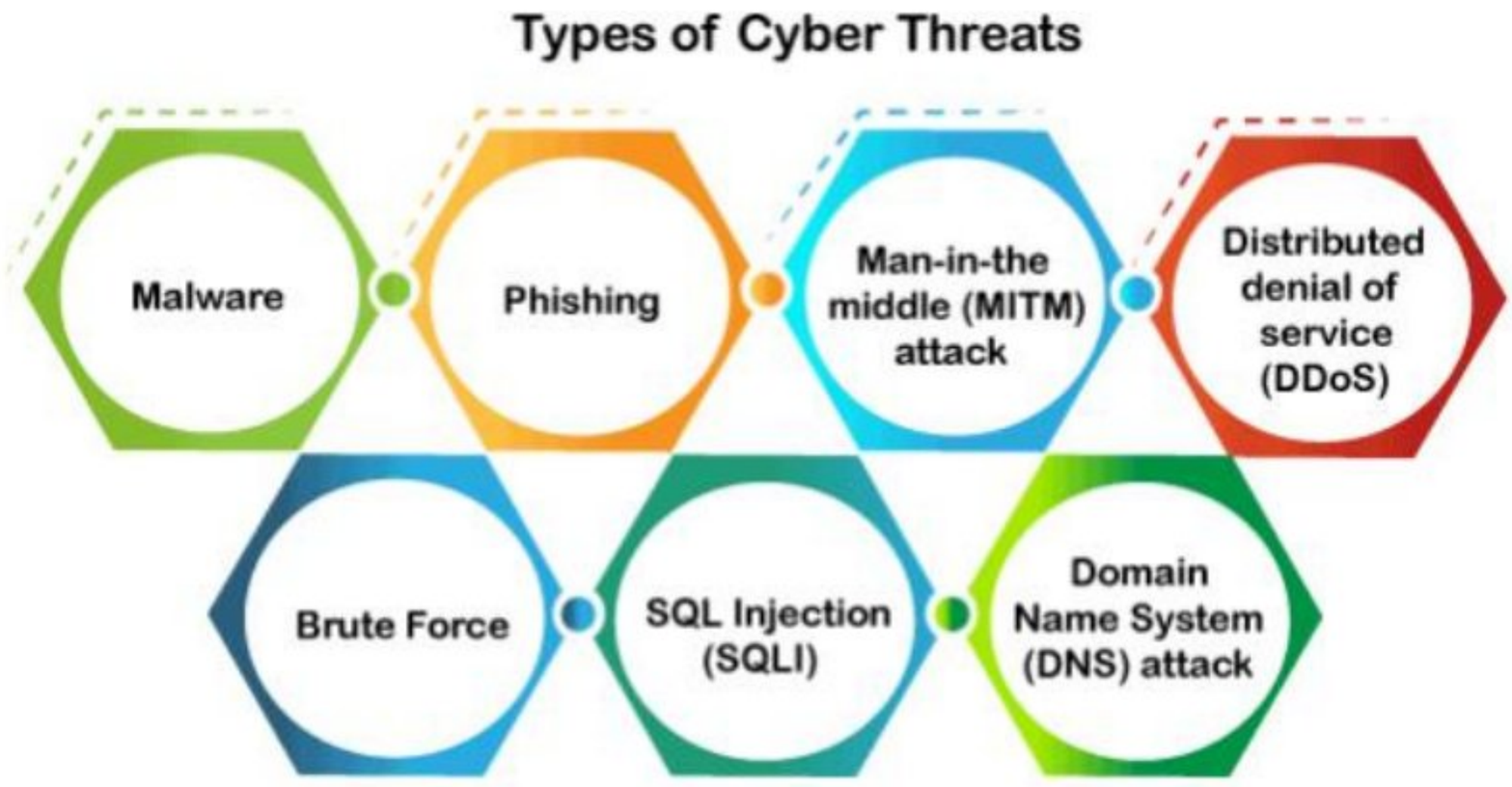


Bad Traffic

Types of Firewall Depending on their structure and functionality, there are different types of firewalls. The following is a list of some common types of firewalls:

- Proxy Firewall
- Packet-filtering firewalls
- State full Multi-layer Inspection (SMLI) Firewall
- Unified threat management (UTM) firewall
- Next-generation firewall (NGFW)
- Network address translation (NAT) firewalls

Security Threats



Malware

Malware means malicious software, which is the most common cyber attacking tool. It is used by the cybercriminal or hacker to disrupt or damage a legitimate user's system. The following are the important types of malware created by the hacker:

Virus: It is a malicious piece of code that spreads from one device to another. It can clean files and spreads throughout a computer system, infecting files, stoles information, or damage device.

Spyware: It is a software that secretly records information about user activities on their system.

For example, spyware could capture credit card details that can be used by the cybercriminals for unauthorized shopping, money withdrawing, etc.

Trojans: It is a type of malware or code that appears as legitimate software or file to fool us into downloading and running. Its primary purpose is to corrupt or steal data from our device or do other harmful activities on our network.

Ransomware:

- This is another kind of cyber crime where the attacker gains access to the computer and blocks the user from accessing, usually by encrypting the data.
- The attacker blackmails the victim to pay for getting access to the data, or sometimes threaten to publish personal and sensitive information or photographs unless a ransom is paid.
- Ransomware can get downloaded when the users visit any malicious or unsecure websites or download software from doubtful repositories. Examples are
- BitPaymer
- Cryptolocker
- DarkSide
- Darma
- DoppelPaymer
- Maze
- MedusaLocker

Worms: It is a piece of software that spreads copies of itself from device to device without human interaction. It does not require them to attach themselves to any program to steal or damage the data.

Adware: It is an advertising software used to spread malware and displays advertisements on our device. It is an unwanted program that is installed without the user's permission. The main objective of this program is to generate revenue for its developer by showing the ads on their browser.

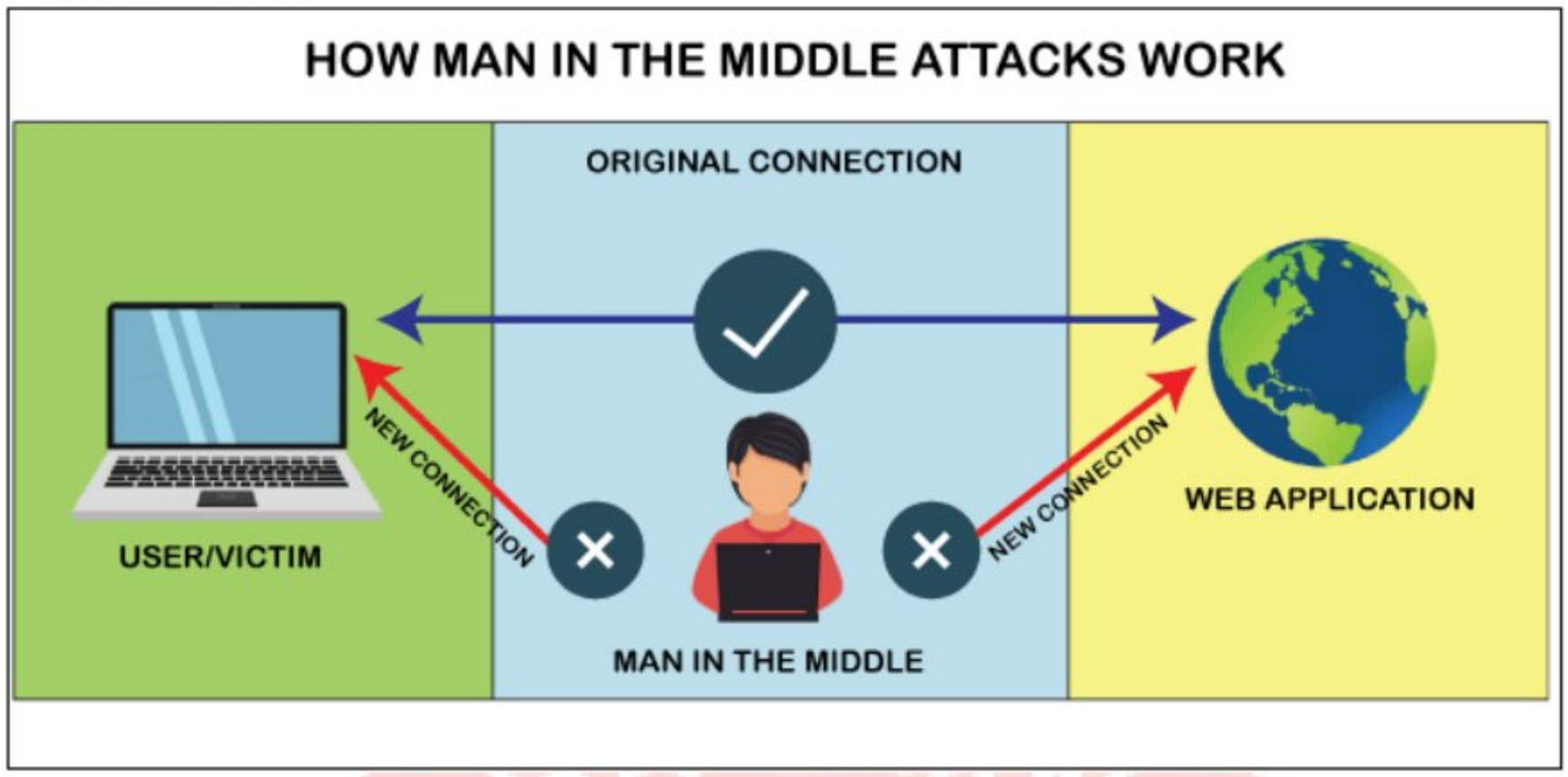
Phishing is the attempt to acquire sensitive information such as usernames, passwords, and credit card details (andsometimes, indirectly, money) by masquerading as atrustworthy entity in an electronic communication.

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.

Hacker.

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.**

Man in Middle attack



A man-in-the-middle attack is a type of cyber threat in which cyber criminal interpret a conversion are data transfer between two users

Denial-Of-Service Attack

A denial-of-service (DoS) attack is a cyberattack on devices, information systems, or other network resources that prevents legitimate users from accessing expected services and resources.

Distributed Denial-of-Service (DDoS) Attack

- A common type of DoS attack is the distributed denial-of-service (DDoS) attack.
- The attacker floods its target with unwanted internet traffic so that normal traffic is unable to reach its intended destination. Hordes of infected, connected devices (e.g., smartphones, PCs, network servers, and Internet of Things devices) from around the world go after a targeted website, network, web application, application programming interface, or data center infrastructure simultaneously to block traffic.

Yo-Yo Attack

The attack is called Yo-Yo since the attacker aims to cause the auto-scaling mechanism to oscillate between the on-attack phase and the off-attack phase. During the on-attack phase, the attacker sends a bursty traffic to actuate the cloud auto-scaling mechanism to the scale-up process.

Spamming

Sending of unsolicited and commercial bulk message over the internet is known as spamming. An email can be classified as spam, if it meets following criteria :

- **Mass mailing :** The email is not targeted to one particular person but to a large number of peoples.
- **Anonymity :** The real identify of the person not known.
- **Unsolicited :** The email is neither expected nor, requested for the recipient. These spams not only irritate the recipients and overload the network but also waste the time and occupy the valuable memory space of the mailbox.

Types of Spam

- Mobile spam
- Email Spam
- Message Spam
- Social Network Spam

Cookies are messages that a web server transmits to a web browser so that a web server can keep track of the user's activity on a specific web site.

Hackers and Crackers

The Crackers malicious programmers who break into secure systems where as Hackers are more interested in gaining knowledge about computer systems and possibly using this knowledge for play full pranks.

Intellectual Property Right (IPR)

Intellectual Property refers to the inventions, literary and artistic expressions, designs and symbols, names and logos.

A) Copyright:-

- Copyright grants legal rights to creators for their original works like writing, photograph, audio recordings, video, sculptures, architectural works, computer software, and other creative works.
- Copyrights are automatically granted to creators and authors. Copyright law gives the copyright holder a set of rights that they alone can avail legally.

B) Patent :-

- A patent is usually granted for inventions. Unlike copyright, the inventor needs to apply (file) for patenting the invention.
- When a patent is granted, the owner gets an exclusive right to prevent others from using, selling, or distributing the protected invention.
- A patent protects an invention for 20 years, after which it can be freely used. Recognition and/or financial benefit foster the right environment, and provide motivation for more creativity and innovation.

(C) Trademark:-

- Trademark includes any visual symbol, word, name, design, slogan, label, etc., that distinguishes the brand or commercial enterprise, from other brands or commercial enterprises.
- For example, no company other than Nike can use the Nike brand to sell shoes or clothes.

Cyber Crime

- Criminal activities or offences carried out in a digital environment can be considered as cyber crime.
- Cyber crimes are carried out against either an individual, or a group, or an organisation or even against a country, with the intent to directly or indirectly cause physical harm, financial loss or mental harassment.
- A cyber criminal attacks a computer or a network to reach other computers in order to disable or damage data or services.
- Cyber criminal may spread viruses and other malwares in order to steal private and confidential data for blackmailing and extortion.
- The nature of criminal activities are alarmingly increasing day-by-day, with frequent reports of hacking, ransomware attacks, denial-of-service, phishing, email fraud, banking fraud and identity theft.
- Open Worldwide application security Project (OWASP) is a non-profit foundation dedicated to improving software security.
- The term "Cyber Threats" in cyber security refers to Malicious activities are carried out by hackers to breach firewalls.

I.Hacking:-

- Hacking is the act of unauthorised access to a computer, computer network or any digital system.
- Hackers usually have technical expertise of the hardware and software.
- Hacking, when done with a positive intent, is called ethical hacking. Such ethical hackers are known as white hat hackers.
- A non-ethical hacker is the one who tries to gain unauthorised access to computers or networks in order to steal sensitive data with the intent to damage or bring down systems. They are called black hat hackers or crackers

II.Phishing and Fraud Emails:-

- Phishing is an unlawful activity where fake websites or emails that look original or authentic are presented to the user to fraudulently collect sensitive and personal details, particularly usernames, passwords, banking and credit card details.

(A) Identity Theft

- Identity thieves increasingly use personal information stolen from computers or computer networks, to commit fraud by using the data gained unlawfully.
- A user's identifiable personal data like demographic details, email ID, banking credentials, passport, PAN, Aadhaar number and various such personal data are stolen and misused by the hacker on behalf of the victim.
- This is one type of phishing attack where the intention is largely for monetary gain.
- Example :- Financial identity theft, Criminal identity theft, Medical identity theft.

III. Cyber Law

- India's IT Act In India the cyber laws are contained in the information technology act, 2000 which was notified on 17 October 2000.
- It is based on the United Nations Commission for International Trade Related Laws (UNCITRAL) model law.
- The IT act aims to provide the legal infrastructure for ecommerce in India by governing the transactions through the internet and other electronic medium.
- Tampering with computer document is non-Bailable offence.
- Every appeal to cyber Appellate tribunal shall be filed within a **45days.**
- Child Pornography is an offence under the **section 67-B**.
- **Section – 4** of IT-Act deals with the legal recognition of electronic record.
- **Section 66-F** deals with Cyber Terrorism.
- Amendment to IT-Act 2000 came to effect on **2008-Oct-02.**
- Section **66,66-C,66-D** deals with credit card fraud.
- The term computer is defined under **section 2(1)(i)** of IT-Act.
- Salami attack are used for the commission of financial crimes.
- Harassing someone through electronic message is offence of stalking.

Chapter:10
Logic Gates

A logic gate is a digital circuit with a single output whose value depends upon the logical relationship between the input(s) and output. In simple words, The relationship between the input values and the output is based on a certain 'logic', hence these circuits are addressed as logic gates.

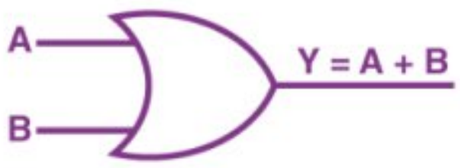
There are **3 types of logic gates–**
1) Basic Gates: OR, AND, and NOT Gates.
2) Universal Gates: NAND, and NOR Gates.
3) Derived Gates: XOR Gates, and XNOR Gates

1) Basic Gates

a) OR Gate

The Boolean expression of OR gate is Y = A + B, read as Y equals A 'OR' B.

OR Logic Gate



The truth table of a two-input OR basic gate is given as;

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

b) AND Gate

The Boolean expression of AND gate is Y = A.B

AND Logic Gate

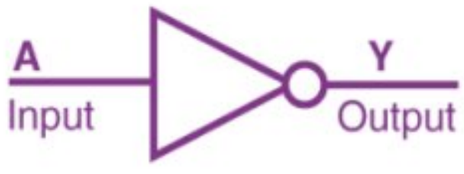
The truth table of a two-input AND basic gate is given as

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

c)Not Gate

The Boolean expression is Y =, read as Y equals NOT A.

NOT Logic Gate



The truth table of NOT gate is as follows

A	Y
0	1
1	0

2) Universal Gate

a) NAND Gate

This basic logic gate is the combination of AND and NOT gate.
The Boolean expression of NAND gate is
Y = A -. B

NAND Logic Gate

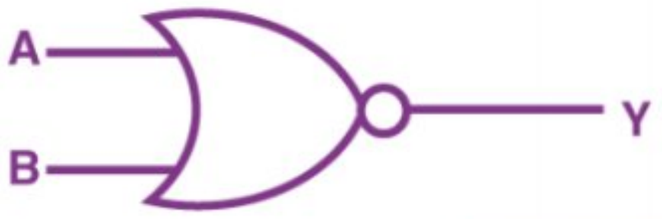
The truth table of a NAND gate is given as;

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

b) NOR Gate

This gate is the combination of OR and NOT gate.
The Boolean expression of NOR gate is
Y = A -+ B

NOR Logic Gate



The truth table of a NOR gate is as follows;

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

3) Derived Gates

a) XOR Gate

Ex-OR gate has two or more inputs but a single output. Ex-OR gate generates a HIGH (1) output if both the inputs are not at the same logic level A≠B.

XOR Logic Gate

The truth table of a XOR gate is as follows;

A	B	Y= A XOR B
0	0	0
0	1	1
1	0	1
1	1	0

b) XNOR Gate

EX-NOR gate has two or more inputs but a single output. EX-NOR gate generates a HIGH (1) output if both the inputs are at the same logic level A=B.

XNOR Logic Gate

A	B	Y= A XNOR B
0	0	1
0	1	0
1	0	0
1	1	1

The truth table of a XNOR gate is as follows;

Chapter :11
Mobile Technology

Mobile Phones works as a telephone using Radio Waves Technology .Cellular Phone works based on Cellular Network.

In 1973 Dr. Martin Cooper Shown a Motorola companies first Mobile phone

Mobile Technologies

GSM

- Global System for Mobile Communication.
- We call GSM as a Cellular Network.
- GSM Introduced to overcome 1G.
- It is Flexible & Average Quality.
- Data Transfer Speed is Low(384 Kbps)
- We use TDMA(Time division Multiple Access) & FDMA (Frequency division Multiple Access) Technology
- GSM Mobile Phones uses SIM(Subscriber Identity Module)

CDMA

- Code Division Multiple Access
- More than one Person can access cellular network at a time.
- It is Flexible & Good Quality.
- CDMA uses R-UIM (Removable user Identity module)

SIM

- In 1991 Giesecke and Devrient Produced first SIM
- SIM is IC(Integrated Circuit) ,it collects IMSI (International Mobile Subscriber Identity) Keys.
- Every SIM cards has 2 Passwords
  - PIN (Personal Identification Number)
  - PUK (Personal Unblocking Code)
- SM Card Size is FF (Form Factor)

GPS

- Global Positioning System
- It is used to get location and time of a person or device and satellite at any weather condition .
- GPS Invited by American Defense Department.
- In 1994 Fully Functional GPS Work Started. Done by Bradford Parkinson , R L Easton & I A Getting

GLONASS:-Global Navigation System:- Russia
Galileo :- Europe Union
COMPASS :- China
IRNSS (Indian Regional Navigation System)

SMS

- Short Message Service (SMS) is the transmission of short text messages to and from a mobile phone, fax machine and/or IP address.
- Messages must be no longer than some fixed number of alpha-numeric characters and contain no images or graphics. Once a message is sent, it is received by a Short Message Service Center (SMSC),
- To do this, the SMSC sends a SMS request to the home location register (HLR) to find the roaming customer. Once the HLR receives the request, it will respond to the SMC.

Chat:-

- Real-time communication between two users via computer.
- In telephone conservations, you say something, people hear it and respond, and one can hear their responses on the spot and can reply instantly.
- A video conference is a live, visual connection between two or more people residing in separate locations for the purpose of communication.

Wi-Fi

- Wireless Fidelity.
- Wi-Fi Uses Access Point is known as Hotspot.
- Wi-Fi is a networking technology that uses radio waves to allow high-speed data transfer over short distances.
- It is developed to helpful for PC, Smartphone.
- Wi-Fi Range is 20 mtr.
- Wi-Fi is Less Secured than Ethernet.

Infrared

- Infrared Electromagnetic Spectrum is used for Communication.
- Ericsson Organization prepared IR Technology.
- Commonly used in Remote Control Technology.
- IR technology is outdated in mobile Communication.

Bluetooth

- It is also known Personal area network
- Physical range is 100m
- It is developed by Ericsson organization in 1994 , it is managed by Bluetooth Interest Group.
- It uses Spread Spectrum Frequency Hopping Technology.
- It used in Wireless Mouse, Keyboard devices to make wire free.

5th Generation:-

- 5G network Millimeter radiations works in spectrum (30-300GHz).
- It can send data in high speed because its frequency is high.
- Due to Surrounding Signals its interference is less.
- It's a LTE(long term evolution) Broadband.
- Its speed it upto 20gbps(In 4G highest speed is 1gbps).

Uses:-

- Low cost, high speed , less latency .
- Used in internet of things, Driverless Vehicles, Real time Analytics , High level Applications and Services, Smart cities & Smart agriculture.
- Recently 5G technology services implemented in India.
- In 6th Indian Mobile Congress, Prime minister Narendra Modi launched 5G technology officially on 2022 October 1 .
- In first stage 13 cities got 5G technology such as : Ahmadabad , Bangalore ,Chandigarh, Chennai, Delhi, Gandhinagar, Hyderabad, Pune, Jamnagar , Kolkata, Lucknow, Mumbai.

Mobile Telephony Generation

1G-1980	2G-1990	3G-2000	4G-2010	5G-2020
First Generation of Wireless Telephone Technology	Second Generation of Wireless Telephone Technology	Third Generation of Wireless Telephone Technology	Fourth Generation of Wireless Telephone Technology	Fifth Generation of Wireless Telephone Technology
Analog Telecommunication Standard	Digital Telecommunication Standard	IMT-2000 (Inter - national mobile Communication	In 2008 ITU-R(International Telecommunication union standard)	5th Generation
Started by Japan 's NNP(Nippin Telegraph and telephony) in 1997	In 1991 Finland used instead of GSM	It was started by Japan NTT DoCoMo . from 10 Oct 2001 used for Commercial Purpose.	Defense Advanced Research Projects agency .	In 2008 South Korean IT R&D started Research .
28 -56 Kbps	56-115Kbps	200Kbps – 2 Mbps	100 Mbps-1Gbps	Very High Speed
	SMS , GPRS , WAP & MMS S Services Started . used CDMA & TDMA . WAP & MMS	Voice call , video Call , Mobile TV, Mobile Internet Service Started	IP Telephony Cloud Computing , Mobile Ultra Broadband came to Existence.	WWW & AI

chapter:12
DBMS

Data Base Management System

Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information.

Mostly data represents recordable facts. Data aids in producing information, which is based on facts. For example, if we have data about marks obtained by all students, we can then conclude about toppers and average marks.

A **database management system** stores data in such a way that it becomes easier to retrieve, manipulate, and produce information.

Database Management Systems (DBMS) provide a set of commands or statements that allow users to interact with databases. These commands are typically categorized into Data Definition Language (DDL), Data Manipulation Language (DML), Data Query Language (DQL), Data Control Language (DCL), and Transaction Control Language (TCL). Here's an overview of each category along with some commonly used commands:

Data Definition Language (DDL):

- DDL commands are used to define, modify, and manage the structure of database objects such as tables, indexes, views, and schemas.
- Common DDL commands include:
- **CREATE TABLE**: Creates a new table in the database.
- **ALTER TABLE**: Modifies the structure of an existing table.
- **DROP TABLE**: Deletes a table and its data from the database.
- **CREATE INDEX**: Creates an index on one or more columns of a table for faster data retrieval.
- **DROP INDEX**: Deletes an index from the database.

Data Manipulation Language (DML):

- DML commands are used to manipulate and query data stored in the database.
- Common DML commands include:
- **SELECT**: Retrieves data from one or more tables based on specified criteria.
- **INSERT INTO**: Inserts new rows of data into a table.
- **UPDATE**: Modifies existing data in a table.
- **DELETE FROM**: Deletes rows of data from a table.

Data Query Language (DQL):

- DQL is a subset of DML and is specifically focused on querying data from the database.
- The primary DQL command is **SELECT**, which retrieves data based on specified criteria and conditions.

Data Control Language (DCL):

- DCL commands are used to control access to data and database objects.
- Common DCL commands include:

- **GRANT**: Grants specific privileges to users or roles.
- **REVOKE**: Revokes previously granted privileges from users or roles.

Transaction Control Language (TCL):

- TCL commands are used to manage transactions within the database.
- Common TCL commands include:
- `COMMIT`: Commits the current transaction, making changes permanent.
- `ROLLBACK`: Rolls back the current transaction, undoing any changes made since the last `COMMIT` or `ROLLBACK`.
- `SAVEPOINT`: Sets a save point within a transaction, allowing partial rollback to that point.

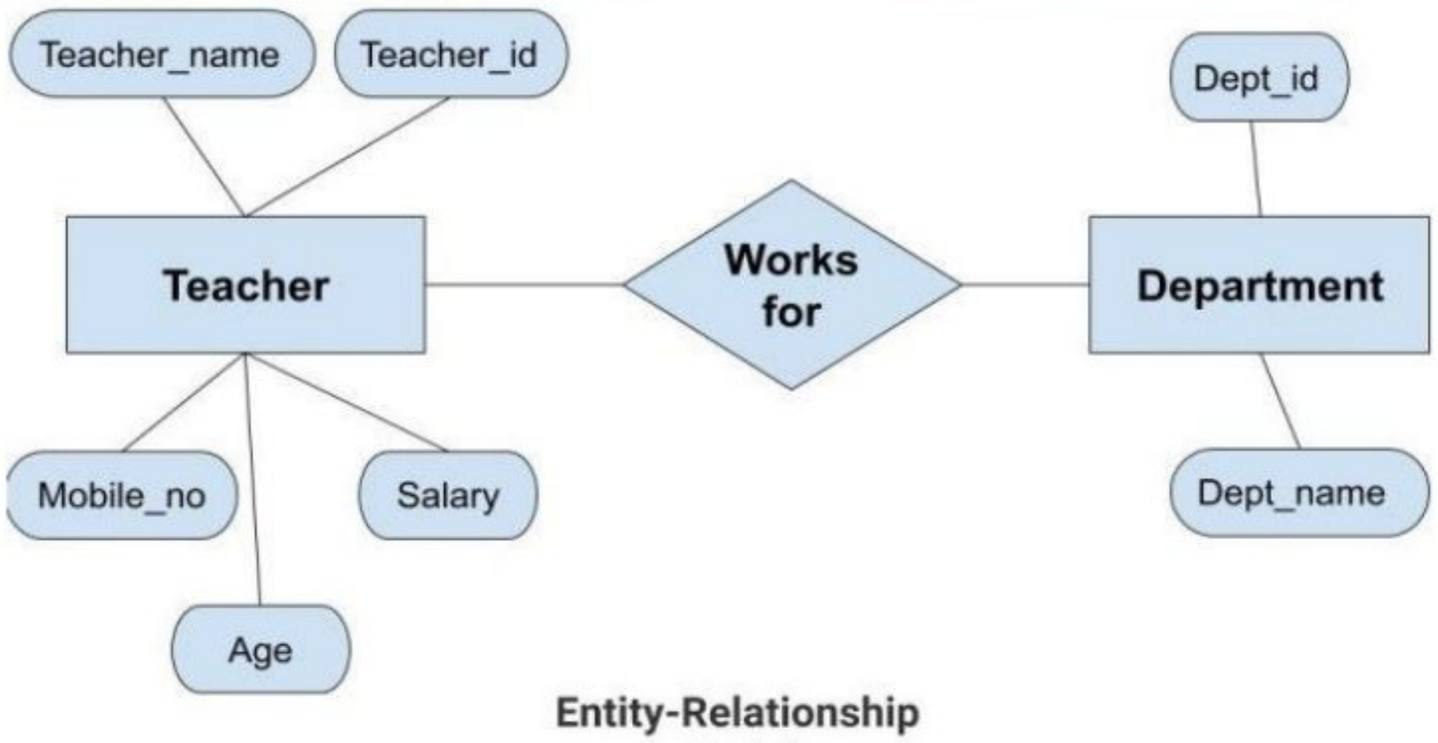
Entity-Relationship Model

Entity-Relationship Model or simply ER Model is a high-level data model diagram. In this model, we represent the real-world problem in the pictorial form to make it easy for the stakeholders to understand. It is also very easy for the developers to understand the system by just looking at the ER diagram. We use the ER diagram as a visual tool to represent an ER Model. ER diagram has the following three components:

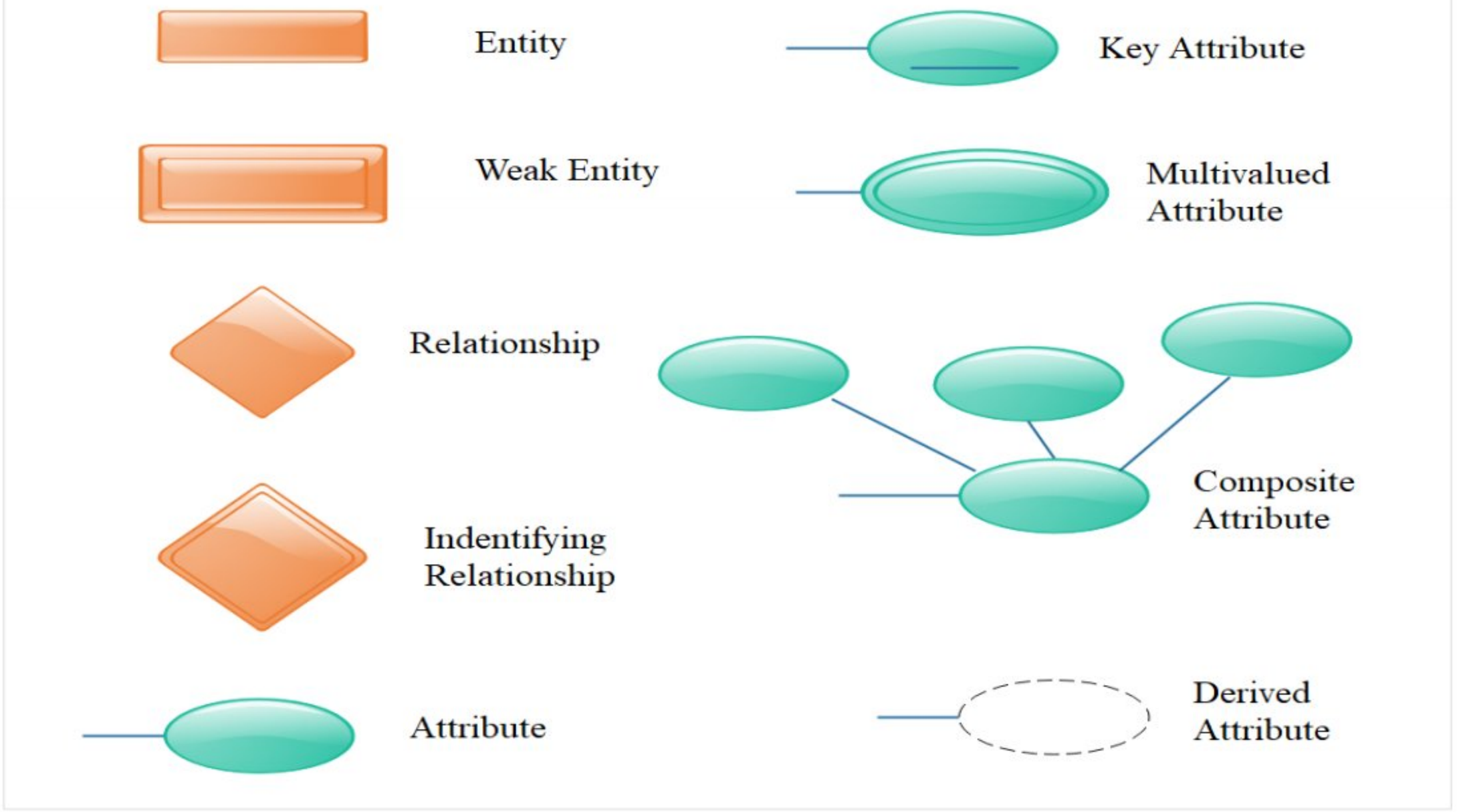
Entities: Entity is a real-world thing. It can be a person, place, or even a concept. Example: Teachers, Students, Course, Building, Department, etc are some of the entities of a School Management System.

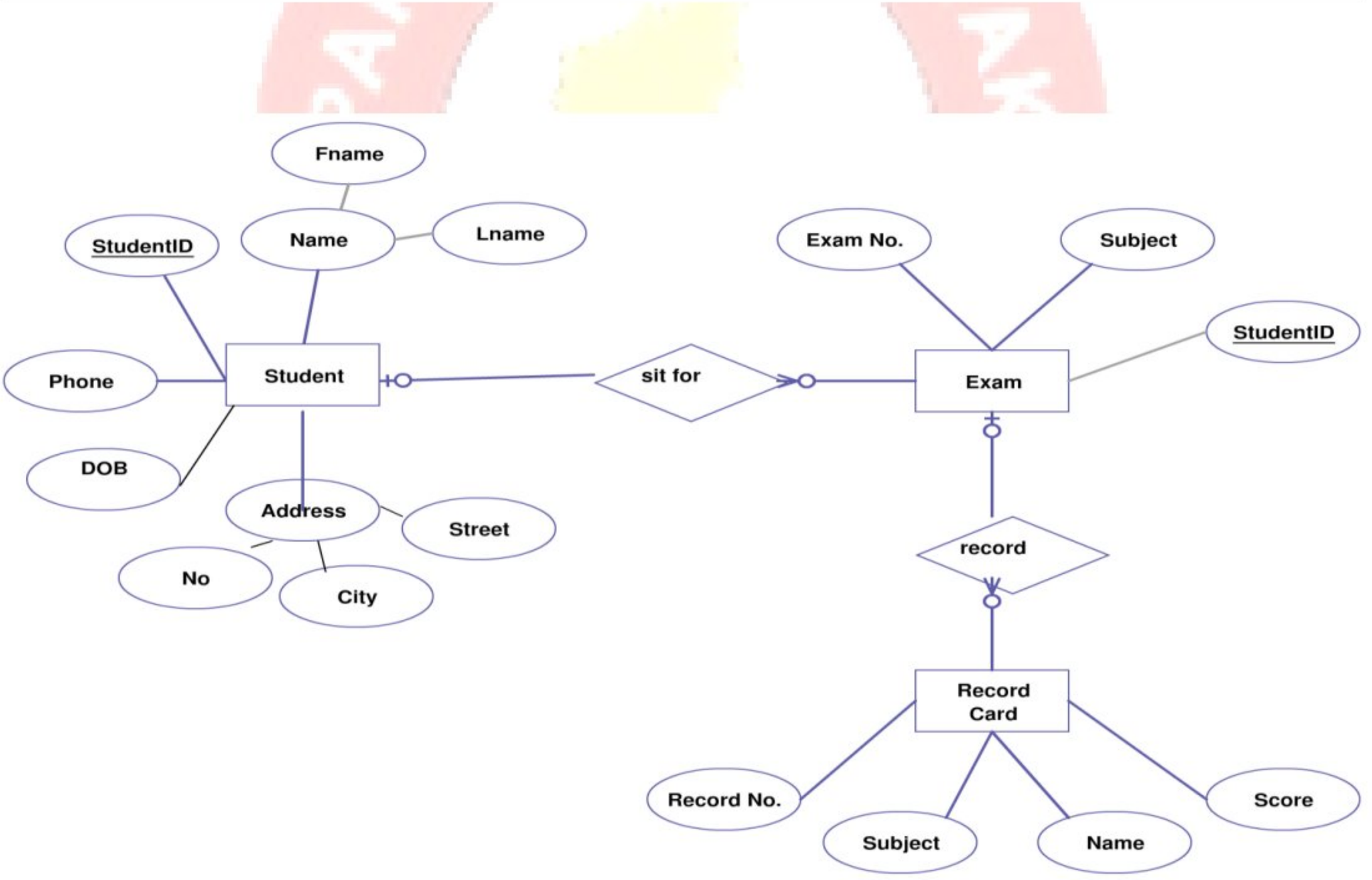
Attributes: An entity contains a real-world property called attribute. This is the characteristics of that attribute. Example: The entity teacher has the property like teacher id, salary, age, etc.

Relationship: Relationship tells how two attributes are related. Example: Teacher works for a department.



Entity-Relationship Model





Student Entity Model

NOTES BY:- SANDESH MS

PH:9071673831/32 , 9886509532

Chapter:13
MS-Office

Microsoft Office is an office suite of desktop applications, servers and services for the Microsoft Windows and Mac operating systems. It includes Microsoft Word, Excel, PowerPoint, Outlook, OneNote, Access and Publisher.

Note: Microsoft Windows Vista was an windows OS for PC not Office Suit.

Office 365 is a subscription service that includes the most recent version of Office, which currently is Office 2016. It comes with the applications you're familiar with, like Word, PowerPoint, and Excel, plus extra online storage, ongoing tech support.

SOME COMMANDS RELATED TO MS OFFICE

1. Save Vs Save As

"Save" simply saves your work by updating the last saved version of the file to match the current version you see on your screen.

"Save As" brings up a prompt to save your work as a file with a different name. For example, you might choose to save a document called "New Doc" as "Final Doc". This way, you can save you file at different stages and keep multiple versions on your hard drive.

2. Save or convert to PDF

You can use the Office programs to save or convert your files to PDFs so that you can share them or print them using commercial printers. To export or save as PDF, in your Office file, on the File menu, click Export or Save As.

1. Undo Vs Redo

You can undo, redo, or repeat many actions in Microsoft Word, PowerPoint, and Excel. Undo reverses the immediate action. Redo reverts the effects of the undo action.

2. Portrait Vs Landscape

The terms portrait and landscape refer to different orientations of the paper; whether it is oriented vertically or horizontally. A page with portrait orientation, typical for letters, memos, and other text documents, is taller than it is wide. Portrait is vertical mode and landscape is horizontal mode.

MS WORD 2016:

Backstage View in MS Word 2016: MS Word 2016 has a backstage view where you can see the recent documents that you've visited or edited and a few templates as well. There is also an option to search for more templates. These templates can help you get the desired layout where a sample data will already be there. You may edit and enter data as you may like.

MS Word 2016 Ribbons:

Quick Access Toolbar

By default, on top is the Quick access toolbar which has 3 default options available: Save, Undo Typing and Repeat Typing. After this there is a drop-down menu for customizing the quick access toolbar. This toolbar is totally customizable; you can position it below the tabs and commands or add more items toit.

To add or remove a command from the quick access toolbar: When you find a favourite command, right-click it, and then click Add to Quick Access Toolbar.

Remove a command by right-clicking it on the Quick Access Toolbar, and then clicking Remove from Quick Access Toolbar.

Tabs in Word 2016

- The ribbon in Word and other Office Suite's Application has Tabs. In Word 2016 there are 9 tabs followed by a new feature of "Tell me what you want to do" arranged in a horizontal fashion.
- The tabs are as follows: File, Home, Insert, design, Layout, References, Mailing, Review, and View.
- The File tab opens the Info Window and has options arranged in a vertical array: Info, New, Open, Save, Save As, Print, Share, Export, Close, Account, Feedback and Options.

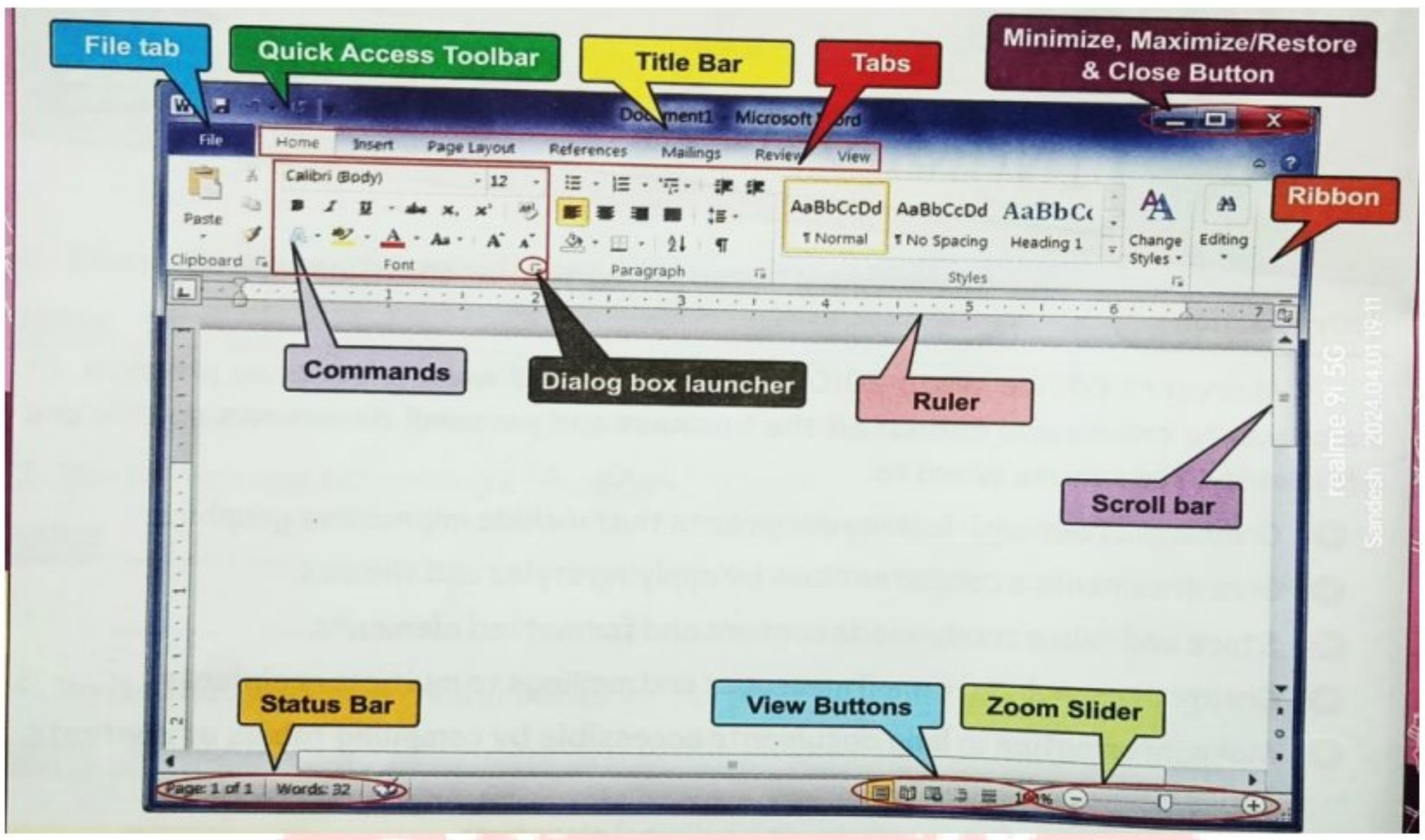
The ribbon containing Tabs also have a new featureof Share and Comment at the extreme right corner.

Note- Each tab has many commands which are grouped into specific categories. Following are the groups for commands under various tabs of MS Word 2016:

1. **Home:** Clipboard, Font, Paragraph, Styles and Editing
2. **Insert:** Pages, Tables, Illustrations, Add-ins, Media,Links, Comments, Header & Footer, Text, Symbols **Design:** Document Formatting, Page Background
3. **Layout:** Page Setup, Paragraph, Arrange
4. **References**: Table of Contents, Footnotes, Research, Citation & Bibliography, Captions, Index, Table of Authorities
5. **Mailings:** Create, Start Mail Merge, Write &Insert Fields, Preview Results, Finish
6. **Review:** Proofing, Accessibility, Language, Comments,Tracking, Changes, Compare, Protect
7. **View:** Views, Page Movement, Show, Zoom, Window, Macros

The Maximum Zoom size is 500% & Minimum Size is 10%

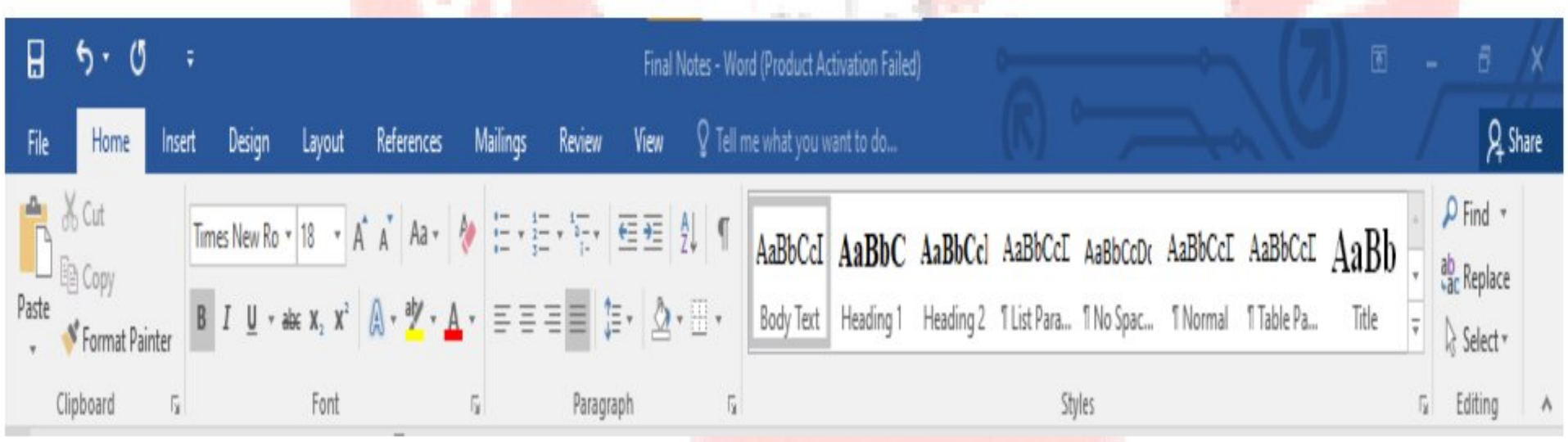
Home Page



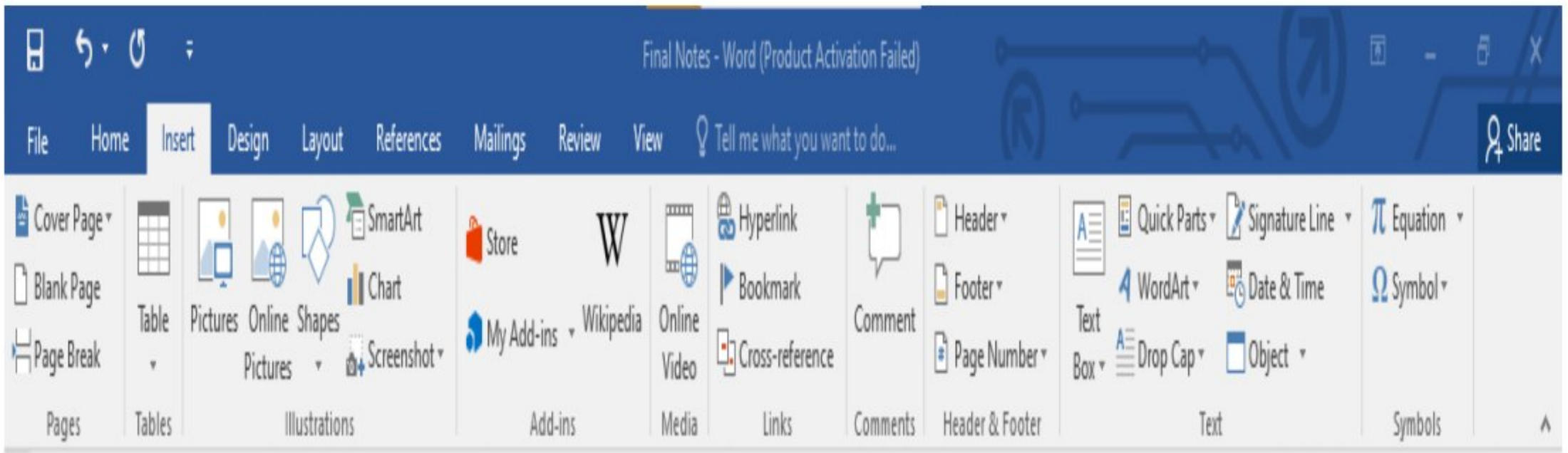
In MS Word 2007 There are 7 Tabs & in 2016 9 Tabs are there.

It comprise Seven Tabs those are Home, Insert, Page layout, References, Mailing, Review and View. Each tab has specific groups of related commands.

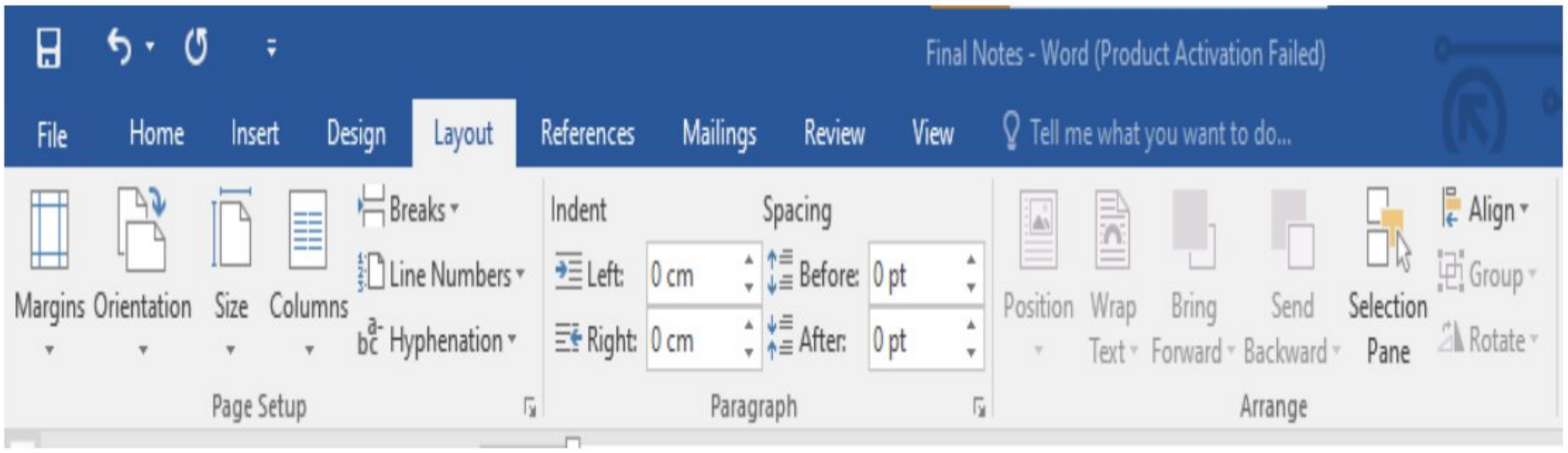
Home Tab



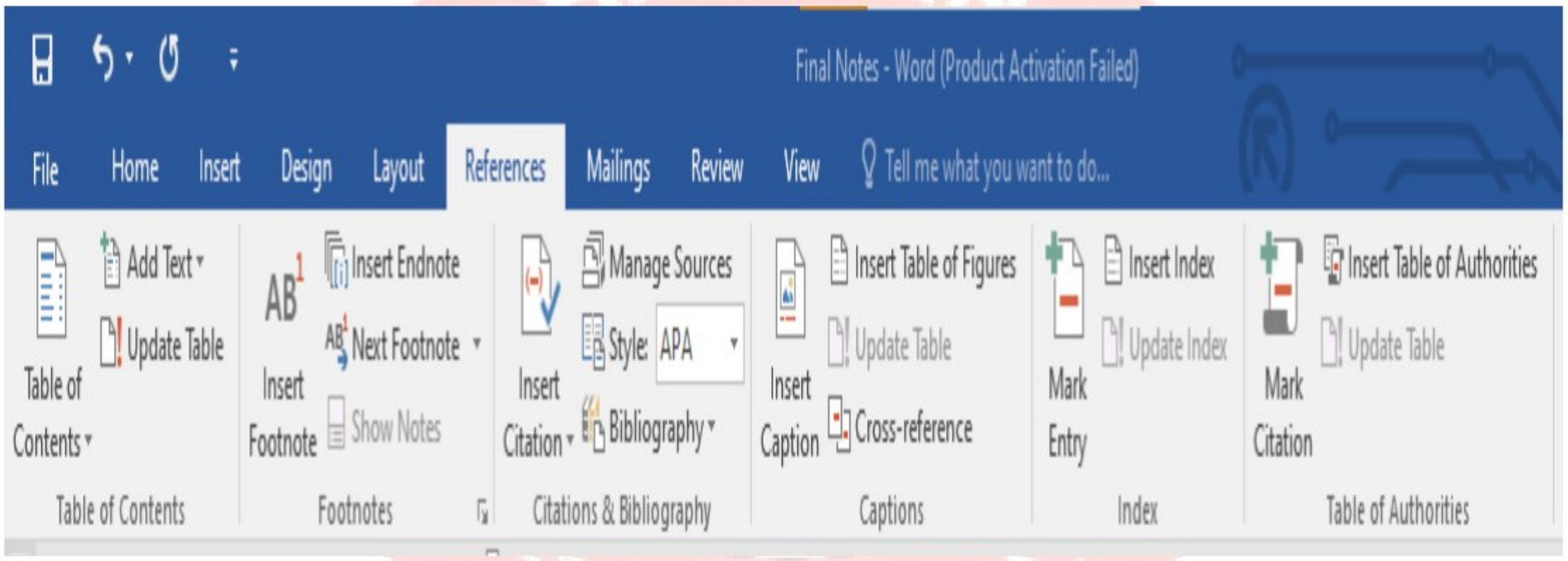
Insert Tab



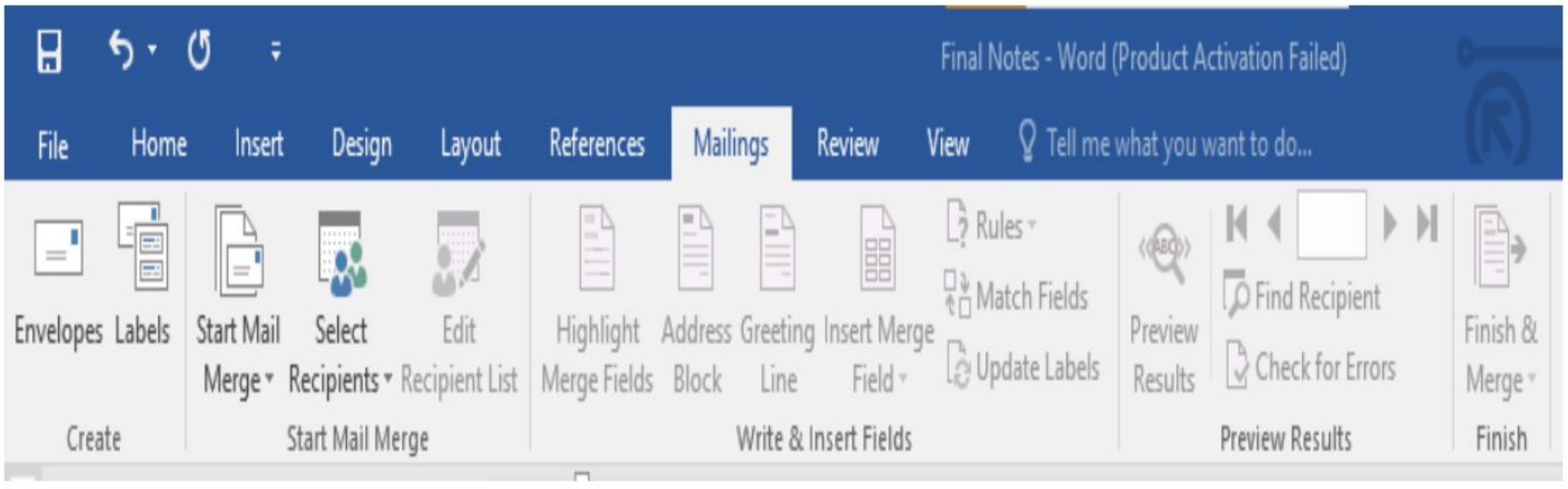
Layout Tab



Reference Tab



Mailings Tab



ಮಧ್ಯ ಕರ್ನಾಟಕದಲ್ಲಿಯೇ ಅತಿ ಹೆಚ್ಚು ಫಲಿತಾಂಶ ಪಡೆದ ಸಂಸ್ಥೆ

ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಮಾನ್ಯತೆ ಪಡೆದ

ಸ್ಪರ್ಧಾ ಕರ್ನಾಟಕ ಅಕಾಡೆಮಿ

Run with goal...

ಶಿವಮೊಗ್ಗ

ಸಮಾಜ ಕಲ್ಯಾಣ ಇಲಾಖೆಯಿಂದ ನಿಯೋಜನೆಗೊಂಡ ಅಭ್ಯರ್ಥಿಗಳಿಗೆ

ಉಚಿತ ತರಬೇತಿ

Available Courses:- ಮಾಸಿಕ ಭತ್ಯೆ ನೀಡಲಾಗುವುದು

UPSC KAS BANKING

RRB Group C SSC

ಅತ್ಯುತ್ತಮ ಗುಣಮಟ್ಟದ ತರಬೇತಿ ಮತ್ತು STUDY MATERIAL ಬಯಸುವ ಅಭ್ಯರ್ಥಿಗಳು

ತಕ್ಷಣ ನೊಂದಾಯಿಸಿಕೊಳ್ಳಿ

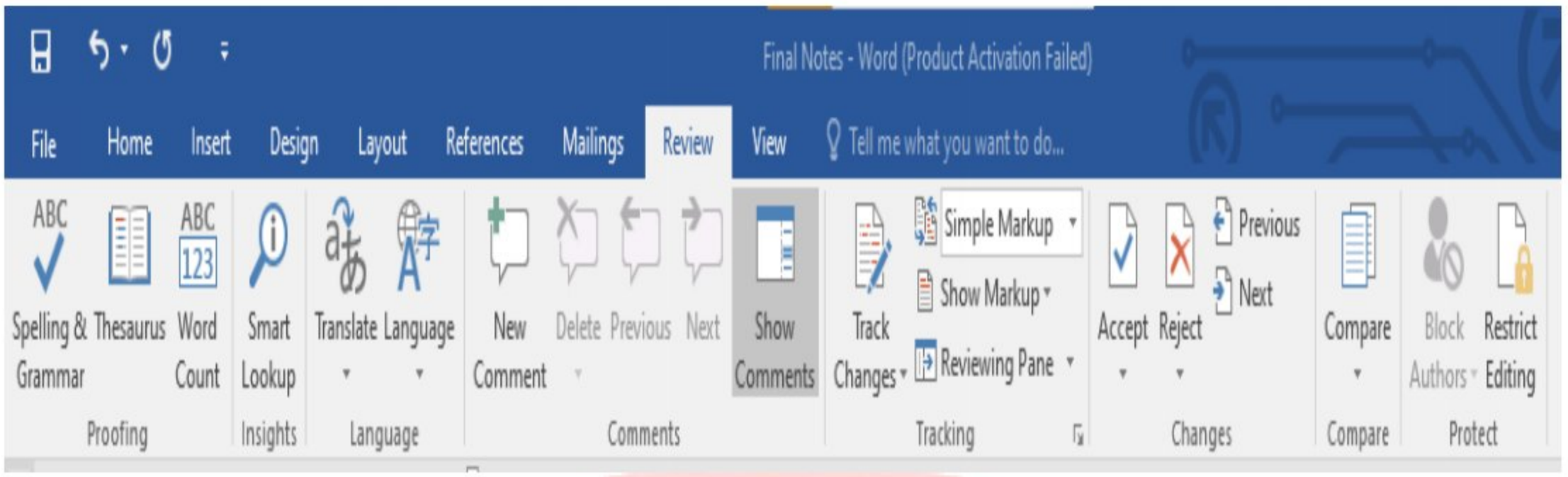
* classes from the expert faculties. * classes in both Kannada and English medium. * weekly mock test.

For more details please contract:-

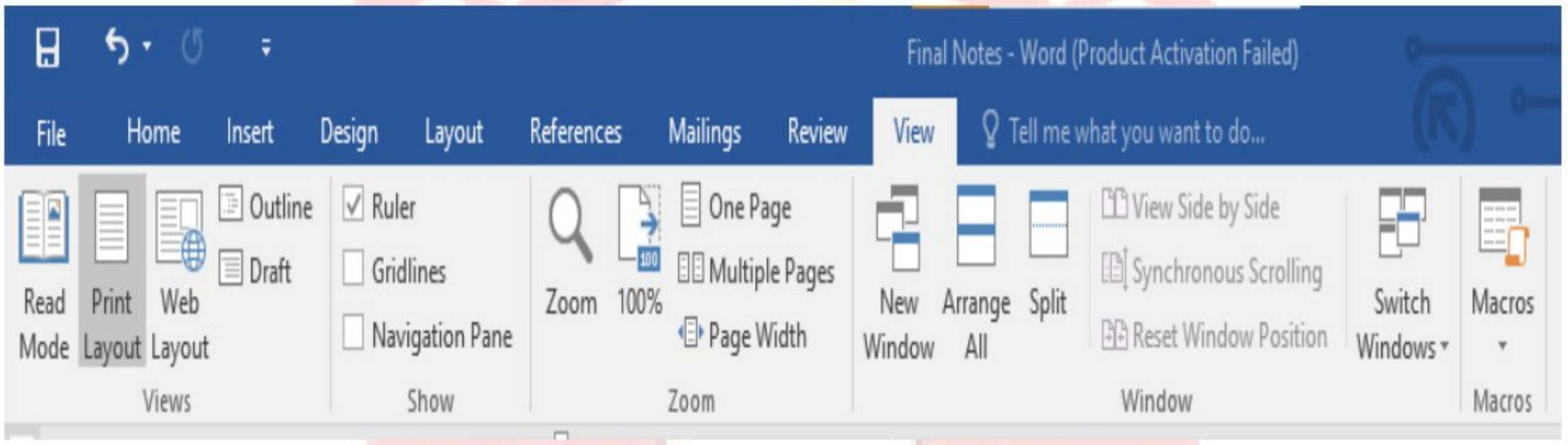
Spardha Karnataka Academy

9071673831, 9071673832

Review Tab



View Tab



MS WORD 2016 SHORT CUT KEYS

To do this	Press
Go to "Tell me what you wantto do"	Alt+Q
Open	Ctrl+O
Save	Ctrl+S
Close	Ctrl+W
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Select all	Ctrl+A
Bold	Ctrl+B
Italic	Ctrl+I
Underline	Ctrl+U
Decrease font size 1 point	Ctrl+[
Increase font size 1 point	Ctrl+]

Centre text	Ctrl+E
Left align text	Ctrl+L
Right align text	Ctrl+R
Justify align text	Ctrl+J
Cancel	Esc
Undo	Ctrl+Z
Re-do	Ctrl+Y
Zoom	Alt+W, Q, thentab in Zoom dialog box to the value you want.
Copy formatting from text.	Ctrl+Shift+C
Apply copied formatting totext.	Ctrl+Shift+V

Create and edit documents:-

To do this	Press
Split the document window.	Alt+Ctrl+S
Remove the document window split.	Alt+Shift+ C or Alt+Ctrl+S
Save a document.	Ctrl+S

Delete text and graphics

To do this	Press
Delete one character to the left.	Backspace
Delete one word to the left.	Ctrl+Backspace
Delete one word to the right.	Ctrl+Delete
Cut selected text to the Office Clipboard.	Ctrl+X
Undo the last action.	Ctrl+Z
Cut to the Spike. (Spike is a feature that allows you to collect groups of text from different locations and paste them in another location).	Ctrl+F3

Find, replace and go to specific items in the document

To do this	Press
Open the search box in the Navigation task pane.	Ctrl+F
Replace text, specific formatting, and special items.	Ctrl+H
Go to a page, bookmark, footnote, table, comment, graphic, or other location.	Ctrl+G
Switch between the last four places that you have edited.	Alt+Ctrl+Z

Work with documents in different views

To do this	Press
Switch to Read Mode view	Alt+W, F
Switch to Print Layout view.	Alt+Ctrl+P
Switch to Outline view.	Alt+Ctrl+O
Switch to Draft view.	Alt+Ctrl+N

Change Paragraph Alignment

To do this	Press
Remove a paragraph indent from the left.	Ctrl+Shift+M
Create a hanging indent.	Ctrl+T
Reduce a hanging indent.	Ctrl+Shift+T
Remove paragraph formatting.	Ctrl+Q

Word

XML file type	Extension
Document	.docx
Macro-enabled document	.docm
Template	.dotx
Macro-enabled template	.dotm

MS Excel

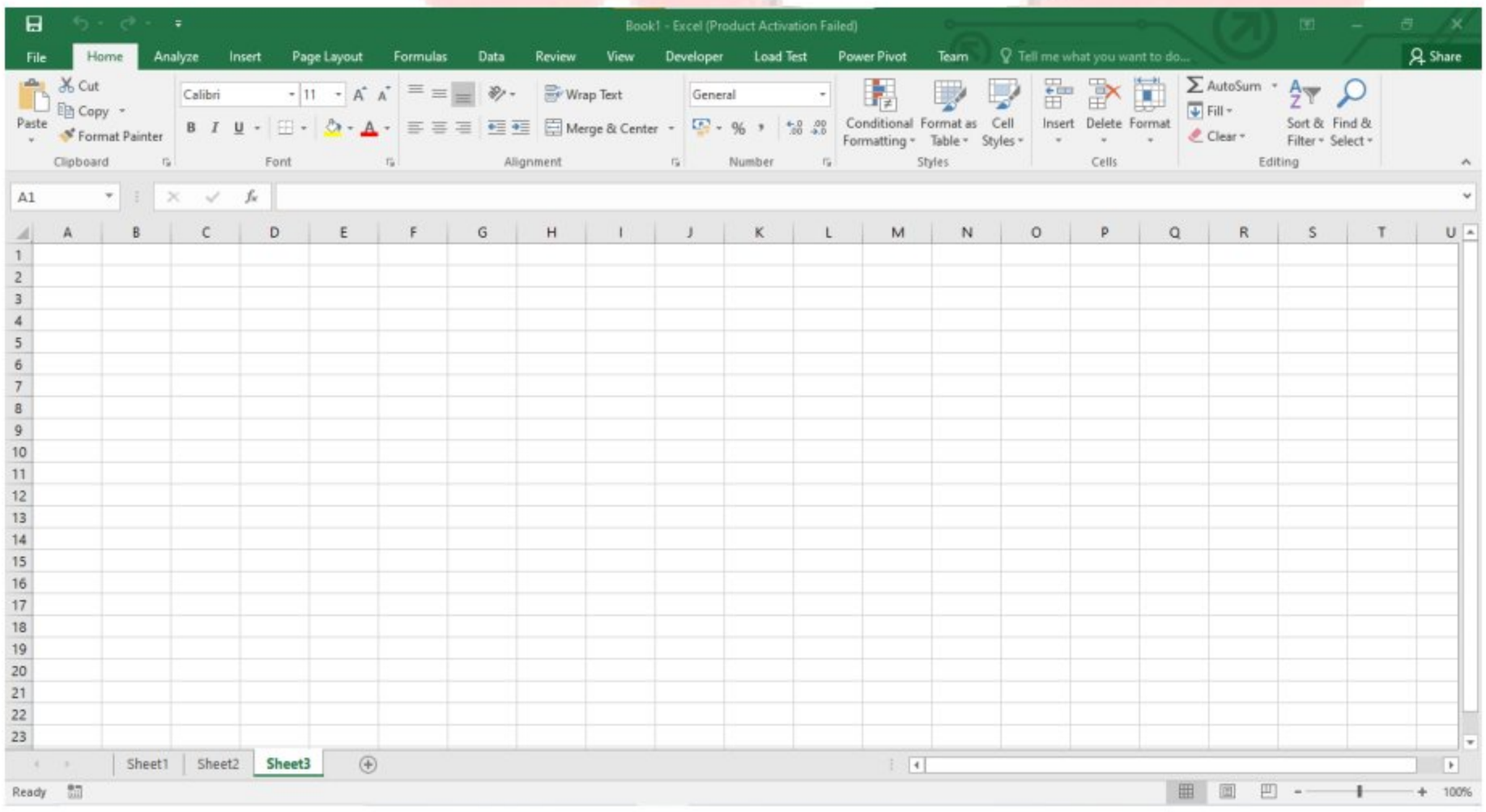
Spreadsheet:

An electronic spreadsheet is a computer application program that can also hold formulas in a cell that serve as a calculator. These formulas allow the electronic spreadsheet to perform calculations much faster and more accurately that spreadsheets created with pencil, paper, and calculator.

The ESS document is a worksheet. Several worksheets can be saved together as a workbook.

The files with the extension .xls or .xlsx. When you start ESS, a blank worksheet opens. A grid of rows and columns containing numbers and text that allows the user to manage, predict, and present information

The Maximum Zoom size is 400% & Minimum Size is 10%



Work Sheet

Date & Time Functions

FUNCTION	DESCRIPTION	EXAMPLE	RETURN VALUE()
DATE	Returns the serial number of a particular date	=DATE(2013,3,29)	3/29/2013
DATEVALUE	Converts a date in the form of text to a serial number	=DATEVALUE("2013/3/29")	41362
DAY	Converts a serial number to a day of the month	=day(2013/03/29)	23
DAYS360	Calculates the number of days between two dates based on a 360-day year	=DAYS360(14,29,)	15
EDATE	Returns the serial number of the date that is the indicated number of months before or after the start date	=EDATE(29,3)	120
EOMONTH	Returns the serial number of the last day of the month before or after a specified number of months	=EOMONTH(29,3)	121
NOW	Returns the serial number of the current date and time	=Now()	3/30/2013 8:37
TODAY	Returns the serial number of today's date		3/30/2013
YEAR	Converts a serial number to a year	=year(2013)	1905

Some of Built-in Function

SUM Function

The Excel SUM function returns the sum of all inserted values. For the input, you can combine any sort of numerical values, e.g. numbers, cell references, ranges or arrays.

Syntax: SUM (number1, [number2], [number3], …)

AVERAGE Function

The Excel AVERAGE function returns the average of all inserted values. For the input, you can combine any sort of numerical values, e.g. numbers, cell references, ranges or arrays.

Syntax: AVERAGE (number1, [number2], [number3], …)

IF Function

The Excel IF function is the most essential function in Excel for logical tests. You can define the value that is returned by this function if the result of the logical test is TRUE and the value that is returned if the result is FALSE.
If you want to test more than one condition, you can simply nest multiple IF functions.
Syntax: IF (logical_test, [value_if_true], [value_if_false])

MIN & MAX Function

The Excel MIN function returns the smallest numeric value in a range of values. Accordingly, the Excel MAX function returns the biggest numeric value in a range of values. Both function only consider numeric values. Empty cells, logical or text values will be ignored.
Syntax: MIN (number1, [number2], …) | MAX (number1, [number2], …)

TRIM Function

The Excel TRIM function removes the leading and trailing spaces from a given text. Additionally, it removes unnecessary spaces between words.
Syntax: TRIM (text)

CONCATENATE Function

The Excel CONCATENATE function joins two or more text items together.
Syntax: CONCATENATE (text1, [text2], …)
COUNT Function
The Excel COUNT function counts the number of cells containing numbers.
Syntax: COUNT (value1, [value2], …)

COUNTA Function

The Excel COUNTA function counts the number of cells containing numbers, text, logical values, error values, and empty text. Empty cells will be ignored.
Syntax: COUNTA (value1, [value2], …)

COUNTIF Function

The Excel COUNTIF function counts the number of cells meeting a specific criteria. It supports all sorts of logical operators and wildcards (*,?) for partial matching.
Syntax: COUNTIF (range, criteria)

Formatting Shortcuts	
CTRL + 1	Format Box
ALT + E + S + T	Copy Format
ALT + H + 0	Increase Decimal
ALT + H + 9	Decrease Decimal
CTRL + SHIFT + 7	Boxing
ALT + O + C + A	Fit Column Width
ALT + H + O + R	Change Tab Name
ALT + W + F	(Un)Split Panes
ALT + W + S	(Un)freeze windows
SHIFT + CTRL + #	Date Format
SHIFT + CTRL + $	$ Dollar Format
SHIFT + CTRL + %	% Percentage Format
ALT + "="	Sum Function

Function Key Shortcuts	
F2	Edit Cells
F4	Anchor Cells
F7	Spell Check
F12	Save As
SHIFT + F2	Insert a Comment
SHIFT + F8	Add to Selection
SHIFT + F10	Right Click
CTRL + F3	Name a Cell
Windows Flag + D	Minimize Programs

CTRL Shortcuts	
CTRL + A	Select All
CTRL + B	Bold
CTRL + C	Copy
CTRL + D	Fill Down
CTRL + F	Find
CTRL + I	Italic
CTRL + N	New Workbook
CTRL + O	Open
CTRL + P	Print
CTRL + R	Fill Right
CTRL + S	Save Workbook
CTRL + U	Underline
CTRL + V	Paste
CTRL + W	Close Window
CTRL + X	Cut
CTRL + Z	Undo

Navigation Shortcuts	
Arrows	Move
CTRL + Arrows	Go to End of Continuous Range
SHIFT + Arrows	Select A Cell Range
CTRL + SHIFT + Arrows	Highlight A Continuous Range
ALT + Tab	Switch Programs
CTRL + Pg Up/Down	Switch Worksheets
Enter	Move below
Shift + Enter	Move Up
Home	Move to Beginning of Line
CTRL + Home	Go to Cell A1
ESC	Cancel
Alt + Enter (when in a cell)	Add a Line

Columns & Rows Shortcuts	
CTRL + 9	Hide Row
SHIFT + CTRL + 9	Unhide Row
CTRL + 0	Hide Column
SHIFT + CTRL + 0	Unhide Column
SHIFT + Spacebar	Highlight Row
CTRL + Spacebar	Highlight Column
SHIFT + CTRL + Plus sign	Insert Blank Cells
CTRL + Minus Sign	Delete Selected Cells
SHIFT + ALT + Left Arrow	Group Rows/Columns
SHIFT + ALT + Right Arrow	Ungroup Rows/Columns

Excel

XML file type	Extension
Workbook	.xlsx
Macro-enabled workbook	.xlsm
Template	.xltx
Macro-enabled template	.xltm
Non-XML binary workbook	.xlsb
Macro-enabled add-in	.xlam

Feature	**Maximum limit**
Worksheet size	1,048,576 rows by 16,384 columns
Column width	255 characters
Row height	409 points
Page breaks	1,026 horizontal andvertical
Total number of characters that a cell can contain	32,767 characters
Characters in a header or footer	255
Maximum number of linefeeds per cell	253
Sheets in aworkbook	Limited by available memory (default is 1 sheet)
Unique cell formats/cellstyles	64,000
Unique font types	1,024 global fonts available for use; 512 per workbook
Hyperlinks in a worksheet	66,530 hyperlinks
Panes in a window	4
Zoom range	10 percent to 400 percent
Fields in a data form	32

MS POWERPOINT 2016:

PowerPoint is a slideshow presentation program that's part of the Microsoft office suite of tools. PowerPoint slides can be plain with only text, or they can include pictures and even animation, including moving text and images. Text can be formatted in the same way as text can be formatted in Microsoft Word,including color, size, and font type.

In PowerPoint 2016 there are 9 tabs followed by a new feature of "Tell me what you want to do" arranged in a horizontal fashion. The tabs are as follows: File, Home, Insert, design, Transition, Animation, Slide Show, Review, and View.

The Maximum Zoom size is 400% & Minimum Size is 10%

1.Home

The home tab in PowerPoint has following groups: Clipboard, Slides, Font, Paragraph, drawing and Editing. The Clipboard, Editing and Font commands are same as that in Word 2016. The Slides group contains commands to insert new slide, choose slide layout, reset the positions and formatting of the slide placeholders and option to organize your slides into sections.

2.Insert

Click Insert to add something to a slide. This includes pictures, shapes, charts, links, text boxes, video and more. The Insert Tab has following groups of commands: Slides, Tables, Images, Illustrations, Add-ins, Links, Comments, Text, Symbols and Media.

3.Design

On the Design tab, you can add a theme or colorscheme, or format the slide background. The design tab has following categories or groups of commands: Themes- Each theme has its own unique set of font,effect, color to create a visually appeasing and overalllook of the slide.

Variants - The current theme or style can be customized using various colour schemes through variants.

Customize- This group contains commands to change slide size and Format Background.

Designer- For instant slide makeovers.

1. Transitions

Set up how your slides change from one to the next on the Transitions Tab. Find a gallery of the possible transitions in the Transition to This Slide group – click More Button at the side of the gallery to see allof them.

2. Animations

User may use the Animations tab to choreograph themovement of things on his slides. Note that you can see many possible animations in the gallery in the Animation group, and see more of them by clicking More Button. Apart from adding animation you canalso customize its duration and timing as you need byusing advanced animation and timing group ofcommands.

3. Slide Show

On the Slide Show tab, set up the way that you wantto show your presentation to others.

4.Review

The Review tab lets you add comments, run spell-check, or compare one presentation with another (such as an earlier version).

5. View

Views allow you to look at your presentation in different ways, depending on where you are in the creation or delivery process.

6. File

At one end of the ribbon is the File tab, which you use for the behind-the-scenes stuff you do with a file, such as opening, saving, sharing, exporting, printing and managing your presentation. Click the File tab to open a new view called the Backstage.

7. Tools tabs

When you click some parts of your slides, such aspictures, shapes, SmartArt or text boxes, you might see a colourful new tab appear.

For example, the Drawing Tools tab appears whenyou click a shape or text box. When you click a picture, the Picture Tools tab appears. Other such tabs include SmartArt Tools, Chart Tools, Table Tools and Video Tools. These tabs disappear or change when you click something else in your presentation.

<u>Terms related to PowerPoint</u>

Slide Show : Each page of a PowerPoint presentation is called a slide. The default orientation of the slide is in landscape layout

Design Template : A design template acts as acoordinated packaged deal. It is created so that even though different slide types can have different layoutsand graphics, the whole presentation goes together as an attractive package.

Slide Master : When you want all your slides to contain the same fonts and images (such as logos), you can make those changes in one place—the Slide Master, and they'll be applied to all your slides. To open Slide Master view, on the View tab, select Slide Master:

Short Cut Keys

Helpful Shortcut Keys	
To	**Press**
Save a presentation	CTRL+S
Print a presentation	CTRL+P
Open a presentation	CTRL+O
Create a new presentation	CTRL+N
New slide	CTRL+M
Duplicate	CTRL+D
Cut	CTRL+X
Copy	CTRL+C
Paste	CTRL+V
Undo (last action)	CTRL+Z
Redo (last action)/repeat	CTRL+Y or F4
Select all	CTRL+A
Close active presentation	CTRL+W or CTRL+F4
Close PowerPoint	CTRL+Q or ALT+F4 *

Creating and Selecting Text and Objects	
To	**Press**
Draw a perfect shape (constrain)	Hold SHIFT while dragging/drawing
Show/Hide ruler	SHIFT+ALT+F9
Show/Hide gridlines	SHIFT+F9
Show/Hide guides	ALT+F9 *
Select one character to the right	SHIFT+→
Select one character to the left	SHIFT+←
Select to the end of a word	CTRL+SHIFT+→
Select to the beginning of a word	CTRL+SHIFT+←
Select one line up	SHIFT+↑
Select one line down	SHIFT+↓
Select multiple objects	Hold SHIFT and click
Select an object	TAB or SHIFT+TAB until the object you want is selected
Select all objects (slide view)	CTRL+A
Select all slides (slide sorter view)	CTRL+A
Select all text (outline view)	CTRL+A

Moving In a Presentation	
To Move	**Press**
First slide	CTRL+HOME
Last slide	CTRL+END
Next slide (depending on Zoom)	PAGE DOWN
Previous slide (depending on Zoom)	PAGE UP
Move from pane to pane	F6

Moving Around In Text	
To Move	**Press**
One character to the left	←
One character to the right	→
One line up	↑
One line down	↓
One word to the left	CTRL+←
One word to the right	CTRL+→
To the end of a line	END
To the beginning of a line	HOME
Up one paragraph	CTRL+↑
Down one paragraph	CTRL+↓
To the end of a text box	CTRL+END
To the beginning of a text box	CTRL+HOME
To the next title or body text placeholder	CTRL+ENTER
Find	CTRL+F or F4
To repeat the last Find action	SHIFT+F4

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Deleting and Copying Text and Objects

To	Press
Copy a shape	CTRL+D or hold CTRL while dragging the shape
Copy a shape and align with original	Hold CTRL+SHIFT while dragging
Delete one character to the left	BACKSPACE
Delete one word to the left	CTRL+BACKSPACE
Delete one character to the right	DELETE
Delete one word to the right	CTRL+DELETE
Cut selected object	CTRL+X
Copy selected object	CTRL+C
Paste cut or copied object	CTRL+V
Undo the last action	CTRL+Z

Working In an Outline

To	Press
Switch between Outline and Slides pane in Normal View	CTRL+SHIFT+TAB
Promote a paragraph	SHIFT+TAB
Demote a paragraph	TAB
Move selected paragraphs up	ALT+SHIFT+↑ *
Move selected paragraphs down	ALT+SHIFT+↓ *
Show heading level 1	ALT+SHIFT+1 *
Expand text below a heading	ALT+SHIFT+PLUS *
Collapse text below a heading	ALT+SHIFT+MINUS *
Show all text or headings	ALT+SHIFT+A *

Formatting In a Presentation

To Format	Press
Align left	CTRL+L
Align right	CTRL+R
Center	CTRL+E
Bold text	CTRL+B
Insert hyperlink	CTRL+K

Presenter View

To Format	Press
Start Presenter View (even with single display)	ALT+F5
Cycle between regions	F6
Cycle through tools	TAB
Read the elapsed time	ALT+W
Down one screen in Notes pane	CTRL+PAGE DOWN
Up one screen in Notes pane	CTRL+PAGE UP
Read the next line in Notes pane	ALT+A
Read the previous line in Notes pane	ALT+Z

Rehearsing

To Format	Press
Set new timings while rehearsing	T
Re-record slide narration and timing	R

Working with Hyperlinks

To Select	Press
Next hyperlink on slide	TAB
Previous hyperlink	SHIFT+TAB
Run selected hyperlink	ENTER (while hyperlink is selected)
Run mouse-over behavior of selected hyperlink	SHIFT+ENTER (while hyperlink is selected)

Working with Media

To	Press
Media: Play/pause	ALT+P *
Media: Stop playback	ALT+Q *
Media: Volume down/up	ALT+DOWN * or ALT+UP *
Media: Skip backward/forward	ALT+SHIFT+LEFT * or ALT+SHIFT+RIGHT *
Media: Mute/unmute	ALT+U *

Getting Help

To	Press
Help during slide show	F1
View task bar	CTRL+T
Display the shortcut menu	SHIFT+F10 (or right-click)

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PowerPoint

XML file type	Extension
Presentation	.pptx
Macro-enabled presentation	.pptm
Template	.potx
Macro-enabled template	.potm
Macro-enabled add-in	.ppam
Show	.ppsx
Macro-enabled show	.ppsm
Slide	.sldx
Macro-enabled slide	.sldm
Office theme	.thmx

Windows Short Cut Key

Shortcut	Description
Windows key	Open and close the **Start** menu.
+1, +2, etc.	Switch to the desktop and launch the *n*th application in the taskbar. For example, +1 launches whichever application is first in the list, numbered from left to right.
+A	Open the action center.
+B	Highlight the notification area.
+C	Launch Cortana into listening mode.[1] Users can begin to speak to Cortana immediately.
Windows logo+D	Switch between **Show Desktop** (hides/shows any applications and other windows) and the previous state.
+E	Switch to the desktop and launch File Explorer with the **Quick Access** tab displayed.
+H	Open the **Share** charm.
+I	Open the **Settings** app.
+K	Open the **Connect** pane to connect to wireless displays and audio devices.
+L	Lock the device and go to the **Lock** screen.
+M	Switch to the desktop and minimize all open windows.

+O	Lock device orientation.
+P	Open the **Project** pane to search and connect to external displays and projectors.
+R	Display the **Run** dialog box.
+S	Launch Cortana.[2] Users can begin to type a query immediately.
+T	Cycle through the apps on the taskbar.
+U	Launch the Ease of Access Center.
+V	Cycle through notifications.
+X	Open the advanced menu in the lower-left corner of the screen.
+Z	Open the app-specific command bar.
+ENTER	Launch Narrator.
+SPACEBAR	Switch input language and keyboard layout.
+TAB	Open Task view.
+,	Peek at the desktop.
+Plus Sign	Zoom in.
+Minus Sign	Zoom out.
+ESCAPE	Close Magnifier.
+LEFT ARROW	Dock the active window to the left half of the monitor.
+RIGHT ARROW	Dock the active window to the right half of the monitor.
+UP ARROW	Maximize the active window vertically and horizontally.
+DOWN ARROW	Restore or minimize the active window.
+SHIFT+UP ARROW	Maximize the active window vertically, maintaining the current width.
+SHIFT+ DOWN ARROW	Restore or minimize the active window vertically, maintaining the current width.
+SHIFT+LEFT ARROW	With multiple monitors, move the active window to the monitor on the left.
+SHIFT+RIGHT ARROW	With multiple monitors, move the active window to the monitor on the right.
+HOME	Minimize all nonactive windows; restore on second keystroke.
+PRNT SCRN	Take a picture of the screen and place it in the **Computer>Pictures>Screenshots** folder.
+CTRL+LEFT/RIGHT arrow	Switch to the next or previous virtual desktop.
+CTRL+D	Create a new virtual desktop.
+CTRL+F4	Close the current virtual desktop.
+?	Launch the Windows Feedback App.

BASIC SHORTCUT KEYS	
Alt + F	File menu options in current program
Alt + E	Edit options in current program
F1	Universal help (for all programs)
Ctrl + A	Select all text
Ctrl + X	Cut selected item
Shift + Del	Cut selected item
Ctrl + C	Copy selected item
Ctrl + Ins	Copy selected item
Ctrl + V	Paste
Shift + Ins	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

Functional Short cut Keys

F1 – Opens the Help screen for almost every program.
F2 – Allows you to rename a selected file or folder.
F3 – Opens a search feature for an application that is active at the moment.
F4 – Alt + F4 closes the active window.
F5 – Allows you to refresh or reload the page or document window.
F6 – Moves the cursor to the address bar in most Internet browsers.
F7 – Used to spell check and grammar check a document in Microsoft Apps (e.g. Word).
F8 – Used to access the boot menu in Windows when turning on the computer.
F9 – Refreshes a document in Microsoft Word and sends and receives emails in Outlook.
F10 – Activates the menu bar of an open application. Shift + F10 is the same as right clicking.
F11 – Enters and exits full screen mode in Internet browsers.
F12 – Opens the Save As dialog box in Microsoft Word.

Chapter:14
Google Sheets

It is a spreadsheet program developed by Google. Google Sheets organizes data in columns and rows and allows you to do mathematical functions. It runs on the web browser.
The first version was released in 2006.
Google Sheets is typically used for:

- Analysis
- Data entry
- Data management
- Accounting
- Budgeting
- Data analysis
- Visuals and graphs
- Programming
- Financial modelling

Google Sheets does not require downloading and installation of the program. It simply runs in your browser.

Syntax:-

A formula in Google Sheets is used to do mathematical calculations. Formulas always start with the equal sign = typed in the cell, followed by calculation.

Selection of Ranges

Selection of cell ranges has many use areas and it is one of the most important concepts of Google Sheets.
There are three ways to select a range of cells

- Name Box
- Drag to mark a range.
- Using the Shift key

Key Points:-

- A single Google sheet is called Worksheet.
- Google sheet saves the changes automatically.
- A group of cells is known as cell-range in Google Sheets.
- In Google sheets, columns are represented by letters. For example, the first column is A, the second column is B.
- The dollar sign ($) is used in the formula to use absolute reference.
- The maximum number of characters is 50,000 in a single cell.
- Most of the functions contain one or more arguments in parentheses.
- The Filters allow you to narrow down the data in your worksheet.
- The @ symbol is not a mathematical operator, the rest of all are the mathematical operators in Google sheets..
- The clear formatting command is used to clear the formatting of selected cells.
- The default Number format is Automatic.
- The currency represents the numbers with the dollars ($) sign.

- To add up numbers in a range - SUM() function is used. Ex:- = SUM (B2:B10).
- To calculate the sum of values in a range based on a true or false condition - SUMIF() function is used.
- Both AND() and OR() functions are used to check combinations of two or more conditions in Google sheets.
- The AVERAGE() function is used to calculate the average (arithmetic mean).
- The Sort Range command in Google Sheets allows for more complex sorting of data.
- TODAY() function returns the current date as a date value.
- NOW() function returns the current date and time as a date value.
- we can freeze header rows and columns. On the menu bar, click "View" and then "Freeze" and choose an option.
- Press CTRL + Space to select the current column in Google Sheets.
- Press SHIFT + Space to select the current row in the Google sheet.
- Press Ctrl + ~ to show all formulas in Google sheet, press the same command again to show the values.
- Press Ctrl + Alt + 9 to hide rows in Google Sheets.

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Chapter:15
Programming Concepts
Flow Chart

We represent the solution to the problem using the tools such as algorithm and flowchart.

K.A.S.

GEOLOGIST

PSI / ESI / RSI

ASSISTANT PROFESSOR

SDA-FDA / PDO / WARDEN

BANKING

OTHER EXAMS

TEACHER POST

RFO/DRFO/BEAT FORESTER

POLICE CONSTABLE

POLICE CONSTABLE

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಮಾಜ ಕಲ್ಯಾಣ ಇಲಾಖೆಯಿಂದ
ಆಯ್ಕೆಯಾದ ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಉಚಿತ ತರಬೇತಿ ನೀಡಲಾಗುವುದು.

ತರಬೇತಿ ನೀಡುವ ಕೋರ್ಸ್‌ಗಳು...

KAS, PSI, PDO, FDA, SDA, VAO, GROUP 'C', PC, BANKING, IBPS, SSC, LIC, TET, GPSTR, HSTR, RAILWAYS, PGCET, DIPLOMA CET, BEAT FORESTER AND LAND SURVEYOR AND OTHER EXAMS

ನಮ್ಮ ಸಂಸ್ಥೆಯ ವಿಶೇಷತೆಗಳು

- ಸುಸಜ್ಜಿತ ತರಗತಿ ಕೊಠಡಿಗಳು.
- ಕನ್ನಡ & ಇಂಗ್ಲೀಷ್ ಮಾಧ್ಯಮದಲ್ಲಿ ಬೋಧನೆ
- ನುರಿತ ಹಾಗೂ ಅನುಭವಿ ಉಪನ್ಯಾಸಕರಿಂದ ಬೋಧನೆ
- 24x7 ಗ್ರಂಥಾಲಯದ ಸೌಲಭ್ಯ & ಉಚಿತ ವೈಫೈ ಸೌಲಭ್ಯ ಒದಗಿಸಲಾಗಿದೆ
- ಪ್ರತಿ ಭಾನುವಾರ ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲೀಷ್ ಮಾಧ್ಯಮದಲ್ಲಿ ಮಾದರಿ ಪರೀಕ್ಷೆಗಳನ್ನು ನಡೆಸಲಾಗುವುದು
- Online Mock Test ನಡೆಸಲಾಗುವುದು
- ಶುದ್ಧ ಕುಡಿಯುವ ನೀರಿನ ವ್ಯವಸ್ಥೆ
- ವಿದ್ಯಾರ್ಥಿ & ವಿದ್ಯಾರ್ಥಿನಿಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಪಿ.ಜಿ. ವ್ಯವಸ್ಥೆ ಇದೆ.

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ಮಧ್ಯಕರ್ನಾಟಕದಲ್ಲಿ ಅತೀ ಹೆಚ್ಚು ಫಲಿತಾಂಶ ಪಡೆದಿರುವ ಸಂಸ್ಥೆ.....

ಸ್ಪರ್ಧಾ ಕರ್ನಾಟಕ ಅಕಾಡೆಮಿ

ವಿನಾಯಕ ಕಾಂಪ್ಲೆಕ್ಸ್, ಕರ್ನಾಟಕ ಸಂಘ ಹತ್ತಿರ, ಬಿ.ಹೆಚ್.ರಸ್ತೆ, ಶಿವಮೊಗ್ಗ

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ಯೋಜನೆಗಳು

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2015, 2020 ಮತ್ತು 2022ರ ತಿದ್ದುಪಡಿ ಒಳಗೊಂಡಂತೆ

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ಹುದ್ದೆಗಳಿಗೆ ನೇಮಕಾತಿ ಮಾರ್ಗದರ್ಶಿ

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- ಭೂಸುಧಾರಣೆ ಕಾಯ್ದೆ
- ಸಹಕಾರಿ ಸಂಘಗಳು
- ಸರ್ಕಾರದ ಯೋಜನೆಗಳು
- ಪ್ರಶ್ನೋತ್ತರ ಮಾಲಿಕೆಯನ್ನು ಒಳಗೊಂಡಿದೆ

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STEPS FOR PROBLEM SOLVING

1. Defining a Problem.
2. Analysing the problem.
3. Developing an Algorithm.
4. Coding.
5. Testing and Debugging.

Algorithm

Algorithms are step-by-step procedures designed to solve specific problems and perform tasks efficiently in the realm of computer science and mathematics.

Pseudocode

- A pseudocode (pronounced Soo-doh-kohd) is another way of representing an algorithm.
- It is considered as a non-formal language that helps programmers to write algorithm.
- The word "pseudo" means "not real," so "pseudocode" means "not real code".

Some of the frequently used **keywords** while writing pseudocode:

- INPUT
- COMPUTE
- PRINT
- INCREMENT
- DECREMENT
- IF/ELSE
- WHILE
- TRUE/FALSE

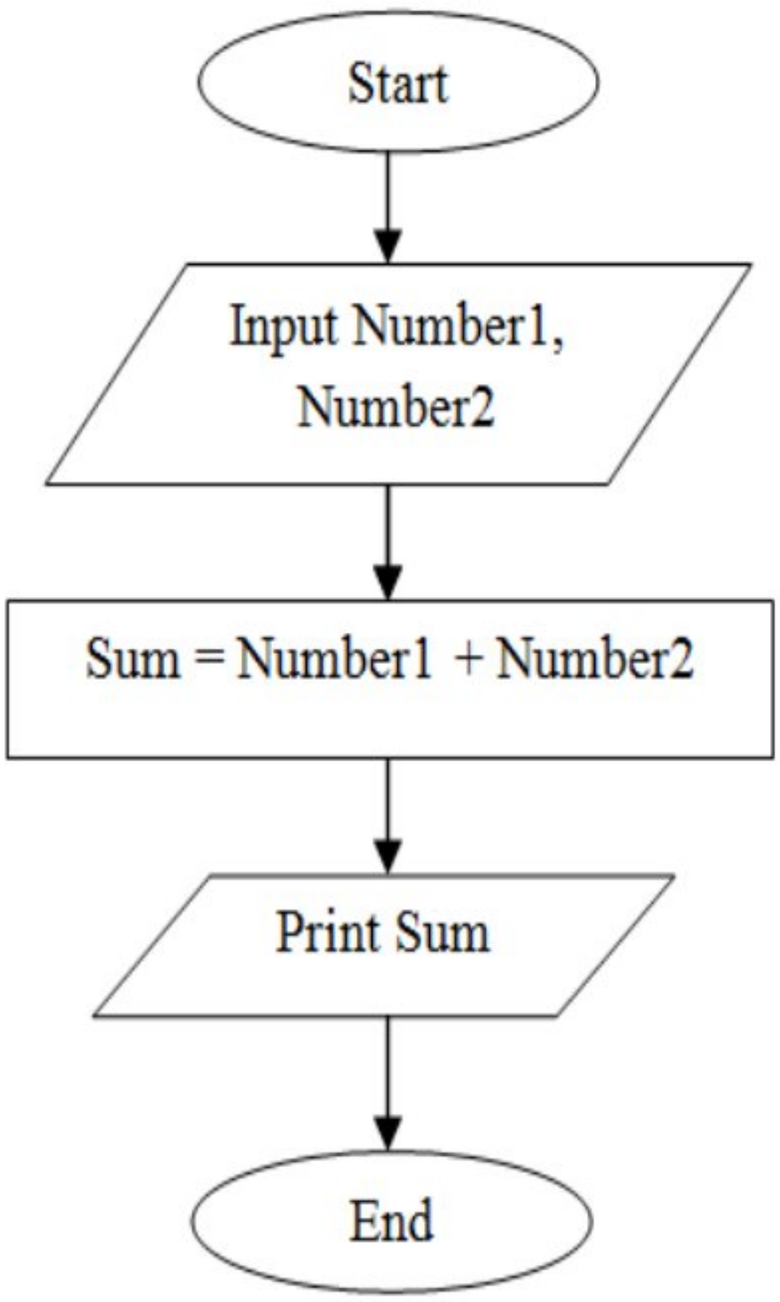
Example:- Pseudocode for the sum of two numbers will be:

```
INPUT num1
INPUT num2
COMPUTE Result = num1 + num2
PRINT Result
```

Flowchart

- A flowchart is a type of diagram that represents a workflow or process.
- A flowchart can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task.
- The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows.

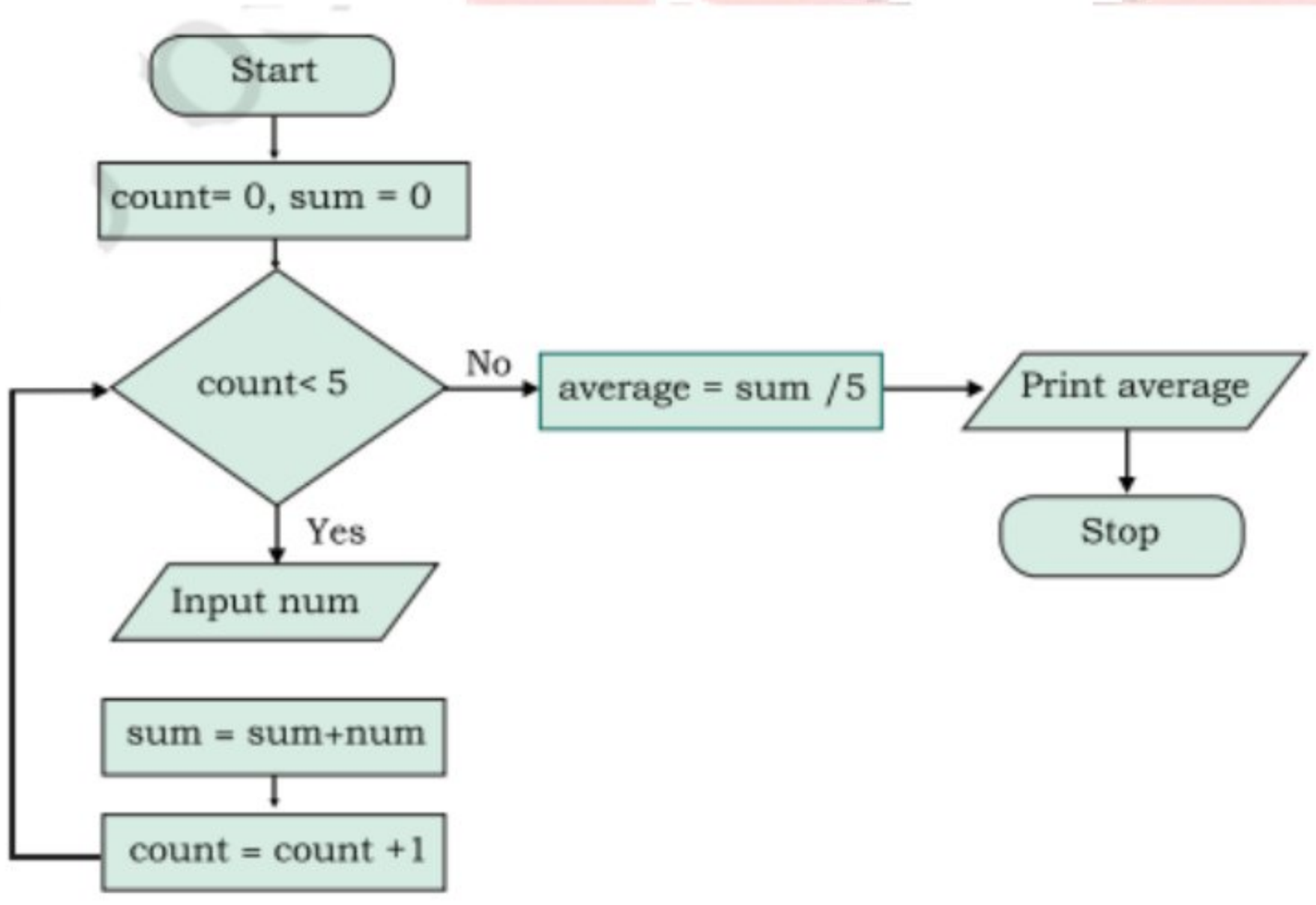
Example:-
Addition of 2 Numbers



Algorithm to addition of two numbers

- Step 1: Start
- Step 2: Declare three variables: num1, num2, and sum
- Step 3: Read the first number (num1) from the user
- Step 4: Read the second number (num2) from the user
- Step 5: Add num1 and num2 and store the result in the sum variable (sum = num1 + num2)
- Step 6: Display the value of the sum
- Step 7: End

Flow Chat using loop



Types of Errors:

There are four types of errors. They are,
1) Syntax errors
2) Semantic errors
3) Logical error
4) Run-time errors

1) Syntax error: Syntax is the set of rules which should followed while creating the statements of the program. The grammatical mistakes in the statements of the program are called syntax errors.

2)Semantic error: Semantic refers to the logic, which should be followed while representing the solution. The wrong use of logic in the program is termed as semantic error.

3)Logical error: If the correct translation of algorithm causes the program to produce wrong results, the error is called as logical error.

4)Run-time error: Errors that are detected during the execution of the program is called as runtime error.

C Tokens

A token is a smallest individual unit in a program or a lexical unit.

Identifiers

An identifier is a name given to the programming elements such as variables, arrays, functions etc. It can contain letter, digits and underscore. C++ is case sensitive and henceforth it treats uppercase and lowercase characters differently

Keywords

- Keyword is a predefined word that gives special meaning to the compiler.
- They are reserved words which can be used for their intended purpose and should not be used as normal
- identifier.
- There are keywords in C++ (developed by Stroustrup)
- Keyword is a predefined word and has special meaning to the compiler.
- The programmer is not allowed to change its meaning,

Encoding

In computers, encoding is the process of converting information or data from one form to another. It is done by putting a sequence of characters (punctuation, letters, symbols, and numbers) or signals into a specialized format for efficient storage or transmission.

Decoding

In computers, decoding is the process of converting encoded data back into its original form for interpreting and understanding the received message.
The science of sending secret cypher & decoding is Cryptography.

Debugging :- It is the process of identifying and correcting or removing the Bugs.

Difference Between Encryption & Decryption

Sl.No	Encryption	Decryption
1.	It is a method of transforming a plain or clear text into cipher text using a key.	It is a method of transforming cipher text into plain or clear text.
2.	Process of encryption takes place at the sender's end.	Process of decryption takes place at the receiver's end.
3.	The encrypted data is called Cipher text.	Decrypted data is called Plain text.
4.	A public key or secret key is used in the process of Encryption.	A secret key or private key is used in the process of Decryption.
5.	In encryption the sender sends the data once it is encrypted.	In decryption, the receiver decodes the data once it is received.

Algorithms Complexity:

Time Complexity cases :-

- **Big O (O)**: Upper bound (worst-case).
- **Omega (Ω)**: Lower bound (best-case).
- **Theta (Θ)**: Tight bound (exact asymptotic behaviour).
- **Little o (o)**: Strict upper bound.
- **Little ω (ω)**: Strict lower bound.

Space Complexity cases:-

- **Delta (Δ)**

Python Language

Features of Python

- Python is a high level language. It is a free and open source language.
- It is an interpreted language, as Python programs are executed by an interpreter.
- Python is case-sensitive. For example, NUMBER and number are not same in Python.
- Python is portable and platform independent, means it can run on various operating systems and hardware platforms.
- In Python PIP stands for Pip Installation Package.

Python Keywords

Keywords are reserved words. Each keyword has a specific meaning to the Python interpreter, and we can use a keyword in our program only for the purpose for which it has been defined.

Keywords in Python				
False	class	finally	is	return
None	continue	for	lambda	try
True	def	from	nonlocal	while
and	del	global	not	with
as	elif	if	or	yield
assert	else	import	pass	
break	except	in	raise	

Variables:-

Variables are containers for storing data values.

Variable Names

A variable can have a short name (like x and y) or a more descriptive name (age, carname, total_volume).

Rules for Python variables:

A variable name must start with a letter or the underscore character

A variable name cannot start with a number

A variable name can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)

Variable names are case-sensitive (age, Age and AGE are three different variables)

Examples:

myvar = "John" , my_var = "Rosa" , _my_var = "Life"

myVar = "Star"

MYVAR = "Janardhan"

myvar2 = "Madhu"

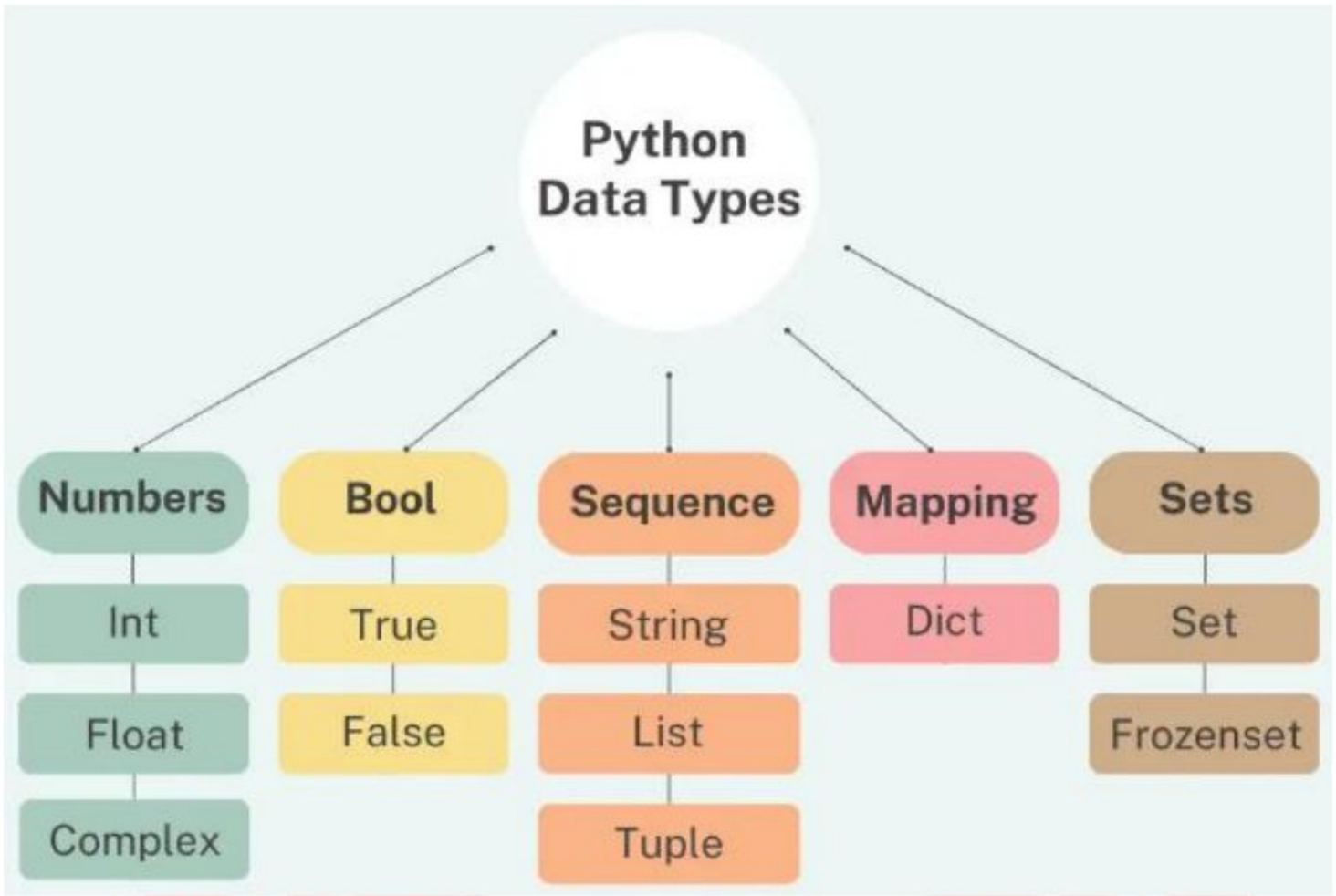
Comments:- ('#')

- Comments are used to add a remark or a note in the source code.
- Comments are not executed by interpreter.
- **Used Symbol "#"**
- Comments can be used to explain Python code.
- Comments can be used to make the code more readable.
- Comments can be used to prevent execution when testing code
- Example:-

  #This is a comment

  print("Hello, World!")

Data Types:-



PYTHON FLOW OF CONTROL

- The order of execution of the statements in a program is known as flow of control.
- The flow of control can be implemented using control structures.
- Python supports two types of control structures—selection and repetition.

1. Selection:-

- if Statement
- if ….else…. Statement
- el-if Statement

2. Repetition :-

- For Loop
- While Loop

3. Indentation :-

Python uses indentation for block as well as for nested block structures. Leading whitespace (spaces and tabs) at the beginning of a statement is called indentation.

4. Break Statement :-

The break statement alters the normal flow of execution as it terminates the current loop and resumes execution of the statement following that loop.

5.Continue Statement:-

When a continue statement is encountered, the control skips the execution of remaining statements inside the body of the loop for the current iteration and jumps to the beginning of the loop for the next iteration.

Python Operators

1. Arithmetic Operator.

Addition	+	**Adds one operand to the other**
Subtraction	-	Subtracts the second operand from the first
Multiplication	*	Multiplies one operand by the other
Division	/	Divides the first operand by the second
Modulo	%	Divides the first INTEGER operand by the second, and returns the remainder

2. Relational Operator.

SYMBOL	OPERATION	EXAMPLE	DESCRIPTION
=	Equal	x = y	True if x is equal to y.
>	Greater than	x > y	True if x is greater than y.
<	Less than	x < y	True if x is less than y.
>=	Greater than or equal to	x >= y	True if x is greater than or equal to y.
<=	Less than or equal to	x <= y	True if x is less than or equal to y.
!=	Not equal to	x != y	True if x is not equal to y.

3. Assignment Operator .

Operator	Description	Examples
= (Assignment)	Assigns the value on the right to the variable on the left.	x = 10; assigns the value 10 to the variable x.
+= (Addition Assignment)	Adds the value on the right to the current value of the variable on the left and assigns the result to the variable.	x += 5; is equivalent to x = x + 5;
-= (Subtraction Assignment)	Subtracts the value on the right from the current value of the variable on the left and assigns the result to the variable.	y -= 3; is equivalent to y = y - 3;
*= (Multiplication Assignment)	Multiplies the current value of the variable on the left by the value on the right and assigns the result to the variable.	z *= 2; is equivalent to z = z * 2;
/= (Division Assignment)	Divides the current value of the variable on the left by the value on the right and assigns the result to the variable.	a /= 4; is equivalent to a = a / 4;

%= (Modulo Assignment)	Calculates the modulo of the current value of the variable on the left and the value on the right, then assigns the result to the variable.	b %= 3; is equivalent to b = b % 3;

4. Logical Operator.

Operators	**Description**
&& (Logical AND)	This operator returns true if all relational statements combined with && are true, else it returns false.
|| (Logical OR)	This operator returns true if at least one of the relational statements combined with || is true, else it returns false.
! (logical NOT)	It returns the inverse of the statement's result.
xor (Logical XOR operator)	This operator returns true if either statement one is true or statement two is true but not both.
and (Logical AND)	This operator returns true if all relational statements combined with it are true, else it returns false.
or (Logical OR)	This operator returns true if at least one of the relational statements combined with it is true, else it returns false.

Chapter-16
Emerging Trends

Robotics:

- A robot is basically a machine capable of carrying out one or more tasks automatically with accuracy and precision.
- Sensors are one of the prime components of a robot.
- Robot can be of many types, such as wheeled robots, legged robots, manipulators and humanoids.
- Robots that resemble humans are known as humanoids. Robots are being used in industries, medical science, bionics, scientific research, military, etc.

1. NASA's Mars Exploration Rover (MER) mission is a robotic space mission to study about the planet Mars.
2. India's first humanoid robot is Manav, which was developed in 2014 by Diwakar Vaish at the A-SET Training and Research Institutes in Delhi.

Manav was designed for research purposes and made using 3D printing technology.

3. Kerala Chief Minister, Pinarayi Vijayan, inaugurated India's first Humanoid Police Robot named KP-BOT, ranked as Sub-Inspector (SI), at the Police Headquarters in Thiruvananthapuram, Kerala. The robot's gender is declared female keeping in mind women empowerment and gender equality.
4. The India Today Group introduced India's First AI Anchor **Sana**, in March 2023.
5. Odisha TV's first regional AI news anchor, **Lisa**, is designed to read news in the Odia language.
6. **Ivan** on the Malayalam TV channel MediaOne, is the rare male AI anchor.
7. On July 11, 2023, 24/7 Kannada news channel Power TV launched **Soundarya**, Kannada's first AI news presenter.

Artificial Intelligence

- Artificial Intelligence (AI) endeavors to simulate the natural intelligence of human beings into machines thus making them intelligent.
- Machine learning comprises algorithms that use data to learn on their own and make predictions.
- Natural Language Processing (NLP) facilitates communicating with intelligent systems using a natural language.
- John McCarthy is known as Father of Artificial Intelligence.
- Global Artificial Intelligence (AI) Summit -2023 in Geneva , Switzerland.
- Global Artificial Intelligence (AI) Summit -2024 in Hyderabad.
- The UK hosted the first global AI Safety Summit in November 2023.
- (The next AI Safety Summit was hosted by South Korea).

Chat GPT:-

- Chat Generative pre-Trained Transformer.
- It is developed by OpenAI organisation .
- OpenAI CEO:- Sam Altman(as on 2024-October).
- OpenAI Portal is SORA.
-

GrokChatbot:- (X AI) it is Twitters Company Chabot.

Meta Platforms

- It is Origin company of What's app. Facebook, Instagram.
- Founded in 2021. HQ:-California (America).

Alphabet Inc.

- Its origin of Google Company.
- Founded in 2015 at California (America).

Internet of Things:

- The term computer network that we commonly use is the network of computers.
- The word IOT firstly used by Kevin Austin(1999)
- Such a network consists of a laptop, desktop, server, or a portable device like tablet, smartphone, smart watch, etc., connected through wire or wireless.
- We can communicate between these devices using Internet or LAN.
- The 'Internet of Things' is a network of devices that have an embedded hardware and software to communicate (connect and exchange data) with other devices on the same network.

Figure 3.10: Internet of Things (IoT)

Sensors:-

- Sensors are very commonly used as monitoring and observing elements in real world applications.
- The evolution of smart electronic sensors is contributing in a large way to the evolution of IoT.
- It will lead to creation of new sensor-based, intelligent systems.
- The accelerometer sensor in the mobile phones detects the orientation of the phone.
- The Gyroscope sensors, tracks rotation or twist of your hand and add to the information supplied by the accelerometer.

Types of Sensors:

- Position Sensors.
- Gyroscope sensor.
- Accelerometer Sensor.
- Pressure Sensors.
- Temperature Sensors.
- Force Sensors.
- Vibration Sensors.
- Humidity Sensors.

Block chain:-

- Block chain is a system that allows a group of connected computers to maintain a single updated and secure ledger which is updated only after all the nodes in the network authenticate the transaction.
- There are four main types of block chain networks: public blockchains, private blockchains, consortium blockchains and hybrid block chains.
- Block chain is a peer-to-peer decentralized distributed ledger technology that makes the records of any digital asset transparent and unchangeable and works without involving any third-party intermediary.
- Block chain networks are much Easier to scale and deal with no real single point of failure.
- Bitcoin is a cryptocurrency, which is an application of Block chain.
- Block chain has three versions. Blockchain 1.0: Currency. Block chain 2.0: Smart Contracts. Blockchain 3.0: DApps.
- On 3 January 2009, Satoshi Nakamoto mined the genesis block of bitcoin (block number 0), which was worth 50 bitcoins and the bitcoin network was formed.
- Unspent Transaction (TX) Output is referred to as UTXO. In a nutshell, it's the amount of cryptocurrency change left over after each transaction.
- A Bitcoin ATM (abbreviated as BATM) is a kiosk where a person can purchase Bitcoin using an automated teller machine.
- A push-based settlement system is how block chain technology works.

Applications

1. Asset Management
2. Cross-Border Payments
3. Healthcare
4. Cryptocurrency
5. Birth and Death Certificates

Chapter-17
Miscellanies
Abbreviations

ANSI:- American National Standard Institute
API:- Application Program Interface
ADSL: Asymmetric Digital Subscriber Line
ASCII:- American standard code for information interchange.
BGP:- Border Gateway Protocol.
CAD:- Computer Aided Design
COBAL:- Common Business Oriented Language
CD:- Compact Disk.
CGI:- Common Gateway Interface.
CHAT:- Conversational Hypertext Access Technology
DATACOM:- Data Communication
RDBMS:- Relational Data Base Management System
DMS:- Direct Memory Access.
DNS:- Domain Name System.
DOS:- Disc Operating System
DLL:- Dynamic Link Library.
GIF:- Graphics Interchange Format.
GSP:- Global Service Provider.
HDML: Handheld Device Mark-up Language.
HDD: Hard Disk Driver
HTML: Hyper Text Mark-up Language.
HTTP: Hyper Text Transfer Protocol
IP: Internet Protocol
ISP: Internet Service Provider
JSP: Java Script Pages
JPEG: Joint Photographic Expert Group
LCD: Liquid Crystal Display.
LED: Light Emitting Diode

MDLP: Mobile Data Link Protocol.
ML: Machine Learning
MIME: Multipurpose Internet Mail Extension.
MODEM: Modulator Demodulator
MPEG: Moving Picture Expert Group.
MP3:- Moving Picture Expert Group-1 audio layer-3
OMR: Optical Mark Reader
OP CODE: Operation Code
PDF: Portable Document Format.
PNP: Plug And Play.
POST: Power on Self Test.
PIN: Personal Identification Number.
RAM: Random Access Memory.
SDK: Software Development Kit
S-HTTP: Secure Hyper Text Transfer Protocol
SMTP : Simple Mail Transfer Protocol
SMPS: Switch Mode Power Supply.
URL: Uniform Resource Locator
URI: Uniform Resource Identifier
VAN: Value Added Network
WWW: World Wide Web.
WML: Wireless Markup Language
Zip: Compressed File
ALU: Arithmetic logic Unit
BIOS: Basic Input Output System
DBMS: Data Base Management System
DPI: Dots Per Inch
GUI: Graphical User Interface
FM: Frequency Modulation
IPS: Instruction Per Second
MICR : Magnetic Ink Character Recognition
OSI : System Inter-Connection
PCB : Printer Circuit Board
TCP/IP : Transmission Control Protocol / Internet Protocol
VDU : Visual Display Unit
FAT : File Allocation Table
IDE : Integrated Development Environment
NIC: Network Interface Card
NVT: Network Virtual Terminal
UPS : Uninterruptible Power Supply
USB: Universal Serial Bus
PNG: Portable Network Graphic
DDL: Data Definition Language
DML : Data Manipulation Language
DQL : Data Query Language
DCL : Data Control Language
TCL : Transaction Control Language
SSD: Solid State Drive
CAM: Computer Aided Manufacturing
MMA: Multi Model Analysis
DMA :Direct Memory Access
RISC: Reduced Instruction set Computer
ISDN: Integrated Services Digital Network
GPRS: General packet radio service
CC: Carbon Copy
BCC: Blind Carbon copy
IMEI: International Mobile Equipment Identity
ARP:- Address Resolution protocol
ACL:- Access Control Unit
ICERT:-Indian computer Emergency Response Team.

Important Points

1. Inventor of Computer BIOS – Gary Kildall
2. Inventor of Computer Bug – Dr. Grace Murray Hopper
3. Inventors of Computer Chip (IC) – Jack Kilby and Robert Noyce
4. Father of Computer Hard Disk – Reynold Johnson
5. Inventor of First Data Base – Dr. Edgar Frank Codd
6. Inventor of Ethernet Computer Networking – David Boggs, Chuck Thacker and Butler Lampson in Xerox PARC
7. Inventor of Computer Scanner – Ray Kurzweil
8. Inventor of Computer Speakers – Abinawan Puracchidas
9. Founder of Apple Computers – Steve Jobs
10. Founder of Artificial Intelligence – John McCarthy
11. Founder of Bluetooth – Ericsson

12. Father of Computer – Charles Babbage
13. Father of 'C' Language – Dennis Ritchie
14. Father of 'C++' language - Bjarne Stroustrup
15. Founder of Email – Shiva Ayyadurai
16. Founder of Google – Larry Page and Sergey Brin
17. Founder of Internet - Vint Deer
18. Father of 'Java' – James Gosling
19. Founder of Keyboard – Christopher Latham Sholes
20. Founder of Linux – Linus Torvalds
21. Founder of Microsoft – Bill Gates and Paul Allen

File Extensions:-

- .doc and .docx (Microsoft Word file)
- .pdf (Adobe Portable Document Format file)
- .rtf (Rich Text Format file)
- .txt (simple text file)
- .wpd (Word Perfect document file)
- .sys (Windows system file)
- .tmp (temporary file)
- .ini (initialization file)
- .cfg (configuration file)
- .msi (Windows installer package file)
- .ico (Windows icon file)
- .avi (Audio Video Interleave video file)
- .mpg and .mpeg (Moving Picture Experts Group video file)
- .wmv (Windows Media video file)
- .3gp (Third Generation Partnership Project
- .c (C and C++ source code files)
- .java (Java source code file)
- .py (Python script file)
- .PHP (PHP: Hypertext Preprocessor script file)
- .vb (Visual Basic file)
- .exe (common Windows executable file)
- .apk (Android package file)
- .com (MS-DOS command line file)
- .bin (binary file)

One Liner Questions

1. The first programming language was – FORTRAN
2. Which stores data permanently in a computer – ROM
3. Which is a main system board a computer – Mother Board
4. What is a bug in a computer terminology – an error in program
5. An electronic path, that sends signals from one part of computer to another is – Bus

6. USB is which type of storage device – Tertiary
7. Who is known as father of Artificial Intelligence - John Mc Carthy
8. Which term is related to database – Oracle
9. Computer resolution measures – Number of Pixels
10. One nibble is equal to how many bits – 4 Bits
11. What can be considered as basic building blocks of a digital circuit – Logic Gates
12. What is full form of RAM – Random Access Memory
13. Which among following is secondary storage device – Hard Disc
14. What is responsible for specifying address of a memory location - Address Bus
15. ULSI microprocessor is used in which generation of computers – Fifth Generation
16. Where is cache memory is located – CPU
17. Which function key is used to check spellings – F7
18. Which type of software is an operating system - System Software
19. If a computer has more than one processor then it is known as – Multiprocessor
20. Which program is run by BIOS to check hardware components are working properly while computer is turned ON – Post
21. What is responsible for finding and loading operating system into RAM - Bootstrap Loader
22. Full form of URL is – Uniform Resource Locator
23. Which type of storage device is a BIOS- Primary
24. Which is most common language used in web designing – HTML
25. BIOS is used for – Loading Operating System
26. Who was the father of Internet – Vin Cerf
27. In banking, railways etc which computers are used – Main Frames
28. Intersection of columns and rows is called a- Cell
29. 1 Mega Byte is equal to - 1024 Kilo Bytes
30. What is full form of EXIF- Exchangeable Image File Format
31. Which operations are performed by RAM - Read and Write
32. WWW stands for- World Wide Web
33. Documents, Movies, Images and Photographs etc are stored at a – File Server
34. Where are saved files stored in computer - Hard disk
35. Which is responsible for communication between Memory and ALU – Control Unit
35. In computer what converts AC to DC – SMPS
36. Who invented keyboard - Christoper Latham Sholes
37hich operating system is developed by Apple- Mac OS
38. From which year 5th generation of computers is considered – 1980
39. What is full form of HTTP - Hyper Text Transfer Protocol
40. Which are the main parts of central processing unit - Control unit and Arithmetic Logic Unit
41. Microsoft office is type of - Application software
42. Which of the following commands is given to reboot the computer? Ctrl+Alt+Del
43. What is correcting errors in a program called ? Debugging
44. BCD is __? Binary Coded Decimal
45. What type of virus uses computer hosts to reproduce itself? Worm
46. In IT, associated memory is called as – Content addressable memory
47. Unix operating system was developed in 1970s by – Bell Labs
48. 'Safari' is a type of – Browser 128. Protocol used for sending an email is – SMTP
48. The command that merges the contents of one file to another is – APPEND
49. In MS word, what is a gutter margin – space left for binding
50. Which company developed Java – Sun
51. What is the base of the Octal Numeral System – 8
52. How many layers are there in the OSI networking model – 7
53. Which error is identified by the complier – Logical Errors

NOTES BY:- SANDESH MS **PH:9071673831/32 , 9886509532**

54. Raymond Samuel Tomilson is famous for developing – Email
55. C++ is a – Programming language
56. Processed data is known as – Information
57. Who invented logarithms – John Napier
58. What is the mascot of Linux Operating System – Penguin
59. What is the full form of "LAN" – Local Area Network
60. How many bits does an IP address contain – 32 Bits
61. Syntax Errors are determined by – Control Unit
62. The tag line "Do No Evil" is owned by – Google
63. Which is a main system board of a computer – Mother Board
64. What is the name of the first super computer of the world – CDC 6600
65. ALU is a part of a computer is – Processor
66. Lisp is a programming language built by whom – John McCarthy
67. In IT terminology failure in the kernel is called as – crash
68. Which key is used to move to next line in a MS-Word document – Enter-Key
69. Netscape Navigator is a – web browser
70. What is a bug In Computer terminology – an error in program
71. In networks, a small message used to pass between one stations to another is known as – Token
72. Who is known as the founder of IBM Company? Thomas J. Watson
73. An image on a computer screen is made up of__? Pixels
74. Full form of MAN ? Metropolitan Area Network
75. Which command in DOS can be used to recover accidentally deleted files? UNDELETE
76. A computer program that converts an entire program into machine language atone time is called__? Characters
77. In which year, the Microsoft company was founded? 1975
78. What is the personal computer operating system that organizes and uses a graphic desktop environment? Windows
79. What are Light pen and joystick ? Input Devices
80. What is a half byte also called as? Nibble
81. SMPS stands for__? Switched mode Power Supply
82. What do we use to change the appearance and positioning of text document in MSWord? Formatting
83. A _____ is approximately a million bytes? Megabyte
84. Daisy wheel, Drum, chain etc are the__? Printers
85. XML stands for __? Extensible Markup Language
86. What kind of scheme is the HTTP protocol? Request/Response
87. Magnetic disk is an example of__? Secondary Memory
88. What is the meaning of OSI, in terms of computers ? Open system Interconnection
89. Which type of storage device is a BIOS ? Primary
90. Personal Computer is – PC
91. A desktop computer is also known as – PC
92. Super computer developed by Indian scientist – Param
93. The third generation computer was made with – Integrated circuits
94. In latest generation computers, the instructions are executed – Both Sequentially and parallel
95. The person contributing the idea of the stored program was – John Neumann
96. The earliest software was developed using – the waterfall model
97. Inventor of C ++ is - Bjarne Stroustrup
98. The first machine to successfully perform a long series of arithmetic and logical operations was – Mark – I
99. Who designed the first electronic computers ENIAC – J Presper Eckert and John W Mauch
100. The father of modern computer is – Alan Turin.

NOTES BY:- SANDESH MS **PH:9071673831/32 , 9886509532**

Old Question Papers

PREVIOUS YEARS QUESTIONS

IBPS RRB PO MAINS 2017

1. In which type of computer, data are representing as discrete signals - Digital computer
2. In world today, most of the computer is - Digital Computer
3. NOS stands for - Network Operating System
4. Touch screen is a - Input & Output Device
5. SNOBOL is an/a - High Level Language
6. What is the name of an application program that gathers user information and sends it to someone through the internet? - Spy bot
7. A computer system that is old and perhaps not satisfactory is referred to as a - Legacy system
8. ASACII is a coding system that provides? - 1024 different characters
9. _____is the process of dividing the disk into tracks & sectors? - Formatting
10. In MS PowerPoint, which is a shortcut key combination for inserting a new slide? – Ctrl + M
11. How many megahertz are in one gigahertz? - 1000
12. What company original developed flash? - Macromedia
13. It allows you to access your email from anywhere? - Webmail interface
14. A device or system connected to a network is also called? - Node
15. What year was Windows XP released? - 2001
16. You can detect spelling and grammar errors by -press F7
17. When you purchase a product over a mobile phone, the transaction is called - m-commerce
18. What is the default left margin in world 2007 document? - 1 inch
19. Which of the following does not belong to the group?
- (spyware, Hub, Worm, Virus, malware) Hub does not belong to the group
20. What is the full form of W3C? - World Web Consortium
21. In MS Word document, Landscape is - Page Orientation
22. Which programming languages are classified as low level language - Assembly Language
23. Verification of login name & password is known as - Authentication
24. 1 KB = 1024 Bytes
25. Which files have .mpg extensions - Video files
26. A computer network tool used to detect hosts or to test the reach ability of a host - Ping
27. To move to the bottom of a MS Word document, press-Ctrl + End
28. What is the purpose of keeping electronic devices such as computer, televisions and remote controlled devices on sleep mode? - Reduce Power Consumption
29. It displays the hierarchical stricter of files, folders & drives on the computer and any network drivers mapped to the computer - windows Explorer
30. Which of these is not a web browser from the group (Mozilla, Opera, Firefox, Safari & Casio) - Casio is not a web browser.
31. Which key deletes the character to the left of the cursor? - backspace
32. Which key deletes the character to the right of the cursor? - delete
33. Which windows was introduced to My Computers - Windows 95
34. The code of Android OS was written in which programming language? - Java, C, C++
35. Vertical Software is - custom, Niche & industry specific software.
36. Capacitor used in - DRAM.
37. In floppy disk data written in - sectors.
38. Time taken to read & write the hard disk - seek time.

39 There is a new antivirus software update available, when it is downloaded to your computer

40. Device drivers are - small, special purpose programs.

IBPS RRB PO MAINS 2018

1. Which of the following topologies has the highest reliability? - Mesh topology
2. Which among the following term is used for: Unauthorized copying of software to be used for personal gain instead of personal backups? - Software piracy
3. EDBIC code can support how many different representations of characters? - 256
4. The main webpage of a website is also known as - Home Page
5. What is a hyperlink? - It is a text or image that you can click on to jump to a new document/page
6. What is a technique used to gain unauthorized access to computers, whereby the intruder sends messages
to a computer with an address indicating that the message is coming from a trusted host? - IP Spoofing
7. Portrait and Landscape are: Page Orientation
8.Internet access by transmitting digital data over the wires of a local telephone network is provided by: - Digital subscriber line
9. Which of the following network devices is also called a concentrator? - Hub
10. What type of web technology creates an online community where people can make statements and others can read and respond to those statements? - Blog
11. How many layers are in the TCP/IP model? - 4
12. Speed of supercomputer measured in - Flops
13. FORTRAN is a programming language. It is more suitable for which purpose? - Scientific applications
14. What is the full form of SMTP? - Simple Mail Transfer Protocol
15. A high speed device used in CPU for temporary storage during processing is called - Register
16. Which is used for establishing connection to other document or locations within a website? - Hyperlink
17. What is Loading Operating System into main memory called? - Booting
18. What is an ICMP stand for :- Internet Control Message Protocol
19. Repeaters function in which layer?- Physical layer
20. Which scrambles a message by applying a secret code? - Encryption
21. Which contains the address of an instruction to be fetched? - Program Counter
22. The Binary Coded Decimal (BCD) uses? - 6 Bits
23. Which was the computer conceived by Babbage? - Analytical engine
24. Who is the father of Personal computer? - Edward Robert
25. A_____is approximately a million bytes? - 1 MB
26. Which is most common tool used to restrict access to computer system? - Passwords
27. A DVD is an example of an? - Optical Disk
28. The ability to recover and read deleted or damaged files from a criminal's computer is an example of a law enforcement specialty called? Computer Forensics
29. RAM can be treated as the_____for the computer's processor? - Waiting Rom
30. The common name for the crime of stealing password is? - Spoofing
31. Who is the father of Internet? - Vint Cerf
32. What type of Operating system MS-DOS is? Command Line Interface
33. Which technology is used in Compact disks? – Laser
34. In which year, the Microsoft company was founded? 1975
35. Which command in DOS can be used to recover accidentally deleted files? - UNDELETE
36. Who is known as the founder of IBM Company? Charles Ranlett Flint
37. Analog computer works on the supply of_____. -Continuous electrical pulses
38.Which means Digital device? - Digital Clock

39. Difference between Minicomputer and microcomputer - Minicomputer works faster than microcomputer
40. Where are the CPU and memory located?- Motherboard
41. Name of the display feature highlighting the screen which requires operator attention is known as? Reverse Video
42. Scientific Name of Computer? - Silicon Sapiens
43. What does DMA stand for? ·Direct Memory Access
44. A normal CD-ROM usually can store up to 680 MB
45. Refresh Rate of monitor is measured in? - - Hertz
46. A modem is connected to a? - Telephone Line 150m
47. What is the functional key to Display save-as box? F12
48. The ability of an OS to run more than one application at a time is called? - Multi tasking
49. In 1999, the Melissa virus was a widely publicized as? E-mail Virus
50. The unit KIPS is used to measure the speed of? Processor -Reverse video
51. When a computer is switched on, the booting process performs? - POST,
52. Which button makes alphabets/letters in uppercase and lowercase and numbers to symbols? – Shift
53. Which of the following commands is given to reboot the computer? - CTRL + Alt + Del
54. What kind of scheme is the HTTP protocol? - Request & Response
55. A 32 bit word computer can access_____ bytes at a time? -4
56. Name of Signal sent by system to respond? - Interrupt
57. The results of arithmetic and logical operations are stored in an? - Accumulator
58. Name the fastest memory ? - Register
59. Thesaurus tool in MS Word is used for ? - Synonyms and Antonyms words
60. What does 'GIF' Stands for? - Graphics Interchange Format

IBPS RRB PO MAINS 2020

1. Which is used for Page Break in MS word? Ctrl + Enter
2. Bing, own & operated by a Microsoft is a? - Search Engine
3. What is the Google equivalent to Microsoft Excel? - Google Sheets
4. Which is used for addition in Microsoft Excel? Sum
5. To insert a new slide in current presentation? Ctrl +M
6. IP Address shows? - Logical Address of Computer
7. Vacuum Tube replace by _____ in second generation.? - Transistor
8. Which is example of Mobile network? - Bluetooth
9. For MAC viewer? File Viewer
10. for PDF Viewer? - Preview
11. Which is Apple's word processor? - Pages
12. Which is Apple's Spreadsheet? - Numbers
13. Which is Apple's Presentation? - Keynote
14. Cloud storage is which type of memory? - Secondary Memory (Non-VolitalMemory)
15. What happens to RAM if system is turned off? Data Loss Permanently
16. How does cache acts between CPU & RAM? Buffer
17. Which is business social networking website? Linked In
18. Another form of MS excels on mobile which is free? Google Sheets
19. Which is open source browser? Mozilla Firefox
20. In Excel N/A Error means? - No Value available/Not available
21. OSI Model files Share Responsibility? - Application Layer
22. The first computer game? Space War
23. First Computer Game was developed by? Steve Russell

24. Name the First Antivirus is? - Reaper
25. Name the First Mobile OS? - Symbian
25. Mnemonics is used in which language? Assembly Language
27. Main frame computer is used for? Large Database
28. The term SQL stands for? Structured Query Language
29. Which is SQL Language? DDL/DCL/DML/DQL
30. Personal Computer is which type of computer? Micro Computer

IBPS RRB CLERK MAINS 2020

1. 1 Megabyte is equal to __? 1024 Kilobytes
2. 3rd generation of computer is known as? - Integrated Circuit (1965-1971)
3. Open Source Operating system (OS) is known as? - Linux
4. CAD stands for? - Computer Aided Design
5. EPROM stands for? - Erasable Programmable Read Only Memory
6. HTML is also known as? -Mark-up Language
7. Touchpad was mainly used for? - Input/Pointing Device
8. VLC (video LAN Client) is also known as? - Media Player
9. RAM is a_____ Memory ? - Volatile
10. VIRUS is also known as? RANSOMWARE
11. First GUI was invented by? - Xerox PARC by Alan Kay
12. Flash Memory is used for? Memory Expansion
13. Sum of Binary 1010+ 0101=? 1010-> 10, 0101 ->5 (1010+ 0101 = 10+5 =15 →1111)
14. Dumb Terminal is also known as? Keyboard
15. MS Excel Watermark =? - Insert Header& Footer Picture ->Picture
16. Hard Disk & CD-ROM connected to? - AT Attachment
17. Hiding IP Address by using? VPN (Virtual Private Network)
18. MAC Address is used for? - Ethernet Connection
19. Address consists of 2 type address, one is IP address and another one is? MAC Address/Physical Address
20._____is a time series consisting of a sequence of quantities? - Discrete Signal
21. Oldest version of Windows is? - Windows XP (2001)
22. URL developed by? - Tim Berners-Lee
23._____network is Comprised of Logical network & physical network? - LAN
24. Mobile OS is also known as? Embedded OS
25. If a person steals your identity & password called? Identity theft + Phishing
26. In which year windows 7 launch? 2009
27. 1 Kilobyte is equals to? 1024 Bytes
28. IPV-6 is in which format? Hexadecimal Format
29. Converts MS word to PDF? Save as Type = PDF
30. Google form is also known as? Survey Software
31. A Video Call Platform from Google is also known as? Google Hangout
32. Website current history is also known as? Cookies
33. Computer network for sharing information is known as? Intranet
34. A process that can be hit or pressed into shape easily without breaking or cracking? Malleable
35. IP Address can convert into_____ Number System? - Octal Number System
36. 0 and 1 are the _____input? - Digital
37. Transmit data over telephone or cable line known as? - MODEM
38. In which year Windows 7 support ended on? - 14 January, 2020
39. 1st generation of computer is known as? - Vacuum tubes (1946-1959)
40. 4th generation of computer is known as? - Microprocessor (1971-1980)

KPSC Group-C /FDA/SDA/PDO old Questions

1. ADSL stands for _____
(1) Automatic Digital Satellite Link
(2) Asymmetric Digital Subscriber Line
(3) Asynchronous Digital Subscriber Link
(4) Audio Digital Signature Link

2. IP address is currently :
(1) 4 bytes long
(2) 6 bytes long
(3) 8 bytes long
(4) 12 bytes long

3. Internet uses the following technology :
(1) Telephone switching
(2) Telegram switching
(3) Packet switching
(4) Circuit switching

4. Match the following :

1. Clip board formatting	a. Keep the source
2. One of the paste options	b. Editing options
3. Find and Replace	c. Image
4. Clip Art	d. Holds the copied contents

	1	2	3	4
(1)	**d**	**a**	**b**	**c**
(2)	d	a	c	b
(3)	b	d	a	c
(4)	b	d	c	a

5. Drop cap option is used to
(1) drop a paragraph
(2) create a large capital letter at the beginning of a paragraph.
(3) adjust the space between the paragraphs.
(4) Format the paragraph.

6. Excel, to highlight only interested cells, we use
(1) Cell formatting
(2) Cell styles
(3) Format text
(4) Conditional formatting

7. In MS word, subscripting can be done with _____ key combinations.
(1) [Ctrl] + [=]
(2) [Ctrl] + [Shift] + [+]
(3) [Ctrl] + [Shift] + [=]
(4) [Ctrl] + [Insert]

8. If we type = NOW () in an Excel cell, we get
(1) Today's date
(2) Current time
(3) Current time & today's date in order.
(4) Today's date and current time in order.

9. Which function key is used to start spell check automatically in MS Word ?
(1) F1 (2) F3
(3) F5 **(4) F7**

10. The formulae = round (8.50, 0) in MS Excel gives
(1) 9 (2) 8.5
(3) 8 (4) 8.6

11. Small programs to automate repetitive tasks in MS word are called _____
(1) Macros (2) Add-on
(3) Mail merge (4) References

12. The formulae in MS EXCEL to find the maximum value of the content of A1, A2, A3, B1, B2 and B3 is _____
(1) = MAX (A1::B3)
(2) = MAXIMUM (A1 : B3)
(3) = MAX (A1 : B3)
(4) = MAXIMUM (A1 :: B3)

13. To insert a new worksheet in MS Excel, we press
(1) Shift + F5 (2) Shift + F6
(3) Shift + F10 **(4) Shift + F11**

14. In MS Excel, you can hide a row by pressing
(1) Ctrl + 9 (2) Ctrl + R
(3) Ctrl + F9 (4) Delete Key

15. Company logos can be inserted in every slide of a PowerPoint presentation using _____.
(1) Slide sorter **(2) Slide master**
(3) Handout Master (4) Notes master

16. What kind of storage device can be affected by fragmentation ?
(1) Optical **(2) Magnetic**
(3) Solid-state (4) EPROM

17. The view that display only text with bullets in MS PowerPoint is
(1) Print layout **(2) Outline**
(3) Normal (4) Slide sorter

18. In Excel, 3-D reference in a formula
(1) Spans worksheets
(2) Limits the formatting options
(3) Cannot be modified
(4) Only appears on summary worksheets.

19. What is the use of bookmarks in MS-Word ?
(1) To correct the spellings.
(2) To jump to a specific location in the document.
(3) To ignore spelling mistakes.
(4) To Save alignments as it is.

20. Which file format can be added to a PowerPoint show ?
(1) .gif (2) .jpg
(3) .wav **(4) All of these**

21. Nudi - Kannada Software uses _____ system.
(1) Unicode (2) EBCDIC
(3) Extended ASCII (4) ASCII

22. _____ is one of the benefits of using a network.
(1) Peripheral Sharing (2) File Security
(3) Protection (4) Reliability

23. MS-Excel : Total number of rows in a sheet.
(1) 65,000 (2) 65,530
(3) 65,536 (4) 65,556

24. MS-Excel : Text wrap in the selected cell can be done using
(1) Ctrl + Enter **(2) Alt + Enter**
(3) Shift + Enter (4) None of these

25. Fastest memory in computer
(1) RAM (2) Cache
(3) ROM (4) Hard disk

26. Which one of these, is not a microprocessor ?
(1) 80186 (2) 80286
(3) 80386 (4) 80486

27. BIOS is stored in _____
(1) RAM (2) ROM
(3) Flash Memory **4) Both 2 & 3**

28. Firmware is stored in
(1) ROM (2) RAM
(3) Cache (4) Hardware

29. Which of the following memories that has shortest access time ?
(1) Magnetic memory (2) Semiconductor memory **(3) Cache memory** (4) Super memory

30. 7-bit alphanumeric code is
(1) BCD **(2) ASCII**
(3) EBCDIC (4) None of these

31. 1 MB is equal to
(1) 1000 bytes (2) 1000 KB
(3) 1024 bytes **(4) 1024 KB**

32. First Super Computer of India
(1) PARAM 6000 (2) PARAM 7000
(3) PARAM 8000 (4) None of these

33. Google Chrome is an example of
(1) Operating system **(2) Web Browser**
(3) Internet Service Provider (4) Website

34. URL stands for
(1) Uniform Resource Locator
(2) Universal Resource Locator
(3) Universal Resource Language
(4) Uniform Resource Link

35. Which of the followings does not belong to the group ?
(1) Linux (2) Windows
(3) Android **(4) Lollipop**

36. ENIAC and UNIVAC are
(1) First generation Computers
(2) Second generation Computers
(3) Third generation Computers
(4) None of these

37. Find the false statement :
(1) .gov stands for government websites
(2) .org stands for commercial websites
(3) .ac stands for educational institute's websites
(4) .in stands for Indian websites

38. Central Processing Unit of a computer include (1) ALU and CD ROM
(2) ALU, Memory, Input / Output Unit
(3) ALU and CU
(4) ALU and Memory

39. Match the following :

1. TCP	a. Network Topology
2. BSNL	b. Web Browser
3. Internet Explorer	c. Transfer Control Protocol
4. STAR	d. Internet Service Provider

Choose the right answer from the options given below :

	1	2	3	4
(1)	a	b	c	d
(2)	b	c	d	a
(3)	**c**	**d**	**b**	**a**
(4)	c	d	a	b

40. In MS-Word toggle case means
(1) changes the letters into upper case
(2) capitalizes each word
(3) changes upper case letters to lower-case and vice-versa
(4) changes the letters to lower case

41. An operating system is a _____.
(1) Utility program **(2) System program**
(3) Application program (4)Antivirus program

42. New document can be opened in MS word using _____ key combinations.
(1) Ctrl + N (2) Ctrl + A
(3) Ctrl + O (4) Ctrl + R

43. A key combination to select all items on the desktop is
(1) Ctrl + Home (2) Alt + A
(3) Ctrl + A (4) Ctrl + Alt + Delete

44. . _____ are the programs which are automatically loaded and works as a part of the Browser.
(1) Add-ons **(2) Plugins**
(3) Firewalls (4) Cookies

45. Symbol which is not permitted in e-mail address is
(1) Underscore (_) (2) At the rate (@)
(3) Blank space ( ) (4) Period (.)

46. Which of the following is not an application program ?
(1) Windows 7 (2) MS Office
(3) Tally (4) CAD

47. In PowerPoint presentation, text box and clip art can be selected from _____ menu.
(1) Insert (2) File
(3) Design (4) Animation

48. To send an e-mail to multiple recipients by hiding the address of other recipients we use option. (1) cc (2) Hide
(3) bcc (4) To

49. This is used to translate image into text
(1) Camera (2) OCR
(3) Scanner (4) Microphone

50. A laser printer's speed is measured in
(1) Lpp (2) Cpm
(3) Ppm (4) dpi

51. Which of the following is not an internet browser ?
(1) Chrome (2) Mozilla
(3) Opera **(4) Google talk**

52. Notepad does not have this option
(1) Word wrap (2) Font
(3) Text Alignment (4) Page setup

53. Which among the following is correct extension of MS-Word files ?
(1) .mdb (2) .xls
(3) .doc (4) .ppt

54. A computer's CPU consists of millions of tiny switches called
(1) Bits (2) Registers
(3) Counters **(4) Transistors**

55. Keys used to perform 'undo' in MS-Word
(1) Ctrl + u (2) Ctrl + z
(3) Alt + u (4) Alt + z

56. File name extension indicates
(1) size of the file (2) author of file
(3) type of content of file (4) date of creation

57. Storage capacity of DVD
(1) 700 MB (2) 700 GB
(3) 4.7 MB **(4) 4.7 GB**

NOTES BY:- SANDESH MS **PH:9071673831/32 , 9886509532**

58. A step by step procedure to solve a problem
(1) An algorithm (2) Flow chart
(3) Software (4) Program

59. Key/s to be used to stop a slide show in MS-PowerPoint
(1) Right arrow **(2) Escape**
(3) Ctrl + s (4) Alt + s

60. Keys used to switch from one program to another
(1) Ctrl + tab **(2) Alt + tab**
(3) Ctrl + alt (4) None of these

61. The following Shortcut key is used to insert new slide into the current presentation :
(1) Ctrl + M (2) Ctrl + N
(3) Ctrl + O (4) Ctrl + P

62. WAN stands for
(1) Wap Area Network
(2) Wide Area Network
(3) Wide Array Net
(4) Wireless Area Network

63. VDU stands for
(1) Video Display Unit
(2) Visual Display Unit
(3) Versatile Display Unit
(4) Visual Disk Unit

64. 1 KB of memory is equal to
(1) 1000 bytes (2) 1000 bits
(3) 1024 bytes (4) 1024 bits

65. Which one of the following is not an Operating System ?
(1) Windows (2) DOS
(3) DBMS (4) Linux

66. Process of eliminating errors in computer programs is known as
(1) Testing (2) Coding
(3) Debugging (4) Designing

67. 1 Byte of memory is equal to
(1) 2 bits (2) 4 bits
(3) 8 bits (4) 16 bits

68.CD-ROM stands for
(1)Common Digital Random Operating Memory
(2) Compact Disc Read only Memory
(3) Compact Disc Random Operating Memory
(4) None of the above

69. A floppy disk is a
(1) Secondary memory (2) Primary memory
(3) Volatile memory (4) None of the above

70. RAM is also called
(1) Permanent memory **(2) Volatile memory**
(3) Super memory (4) Sub memory

71. One of the function of Operating System is
(1) Memory Management (2) Batch Processing
(3) Time Sharing (4) None of the above

72. _____ acts as an interface between man and **machine.**
(1) Operating System (2) Compiler
(3) Interpreter (4) Assembler

73. 'C' is a/an _____ language.
(1) Low level **(2) High level**
(3) Assembly level (4) Object oriented

74. MAN stands for
(1) Machine Access Network
(2) Metropolitan Area Network
(3) Machine Area Network
(4) Machine Allow Network

75. FTP stands for
(1) Format Transfer Protocol
(2) File Transfer Protocol
(3) File Transaction Protocol
(4) File Transmission Protocol

76. An error which occur due to wrong use of statements in a programming language is
(1) Syntax error (2) Semantic error
(3) Logical error (4) Runtime error

77. SMTP stands for
(1) Simple Mail Transfer Protocol
(2) Simple Mail Text Protocol
(3) Simple Mark Transfer Protocol
(4) Simple Mark Text Protocol.

78. DOS stands for
(1) Desk Operating System
(2) Disk Operating System
(3) Disk Operation System
(4) Disk Operator System

79. Which of the following is not a function of Operating System ?
(1) Booting the system
(2) Debugging
(3) Interfacing with users
(4) Buffering and Spooling

80. Notepad does not have this option :
(1) Word wrap (2) Font
(3) Text Alignment (4) Page setup

81. A Computer's CPU consist of millions of tiny switches called
(1) Bits (2) Registers
(3) Counters **(4) Transistors**

82. Which of the following memories has shortest access time ?
(1) Magnetic memory (2) Semiconductor memory (3) **Cache memory** (4) Super memory

83. The Cut, Copy and Paste options in MS-Word are available in the following menu :
(1) Tools bar (2) Main menu
(3) Edit menu (4) Type menu

84. The paragraph mark (¶) is a formatting mark that indicates where the _____ was pressed.
(1) Tab key (2) Spacebar key
(3) Enter key (4) Shift key

85. The shortcut key Ctrl + H in MS-Word is used to
(1) Open search bar **(2) Replace**
(3) Open main menu bar (4) Open history

86. Drop Cap means
(1) Create all Capital letters
(2) Delete all Capital letters
(3) Create a Capital letter at the beginning/margin of the paragraph
(4) None of the above

87. HTML stands for
(1) Hyper Tension Medicare Laboratory.
(2) Hyper Text Mark-up Language.
(3) Hyper Text Making Language.
(4) Hyper Text Marking Links

88. Which of the following communication channel that allows data transmission from source to destination in both directions simultaneously ?
(1) Full duplex (2) Half duplex
(3) Duplex (4) None of the above

89. What is the full form of 'SIM' in SIM card ?
(1) Student Identification Mark
(2) Subscriber Identification Module
(3) Subscriber Identification Machine
(4) Subscription In Mobile

90. The mode of operation in which the data packets are transmitted to every computer simultaneously on the network is called :
(1) Broadcasting (2) Miscasting
(3) Multicasting (4) Unicasting

91. The following function key on keyboard can be used to view slide show :
(1) F1 (2) F2 **(3) F5** (4) F6

92. The maximum zoom percentage in Microsoft Power Point is :
(1) 100% (2) 200%
(3) 300% **(4) 400%**

93. Which of the following is not an Operating System ?
(1) Windows 2008 (2) UNIX
(3) LINUX **(4) ORACLE**

94. After typing a C program in a C Editor
(1) The program should be compiled
(2) The program should be Executed
(3) First (1) then (2)
(4) None of the above.

95. For large networks _____ topology is used.
(1) bus. (2) ring.
(3) star. (4) irregular.

96. A network device that converts digital signals into analog signals is
(1) packet (2) gateway
(3) modem (4) router

97. A flowchart denotes
(1) An instruction
(2) a program
(3) graphical form of algorithm
(4) Both (1) and (2)

98. 'C' programming language was developed by
(1) Charles Babbage **(2) Denis Ritchie**
(3) BJarne Straustrup (4) Blaise Pascal

99. A hybrid computer can process
(1) Digital data (2) Analog data
(3) Both (1) and (2) (4) None

100. Which Symbol is used to make a Decision in Flow Chart

a)  **b)** 

c)  **d)**

101. Basic data types supported by C language
(1) integer (2) character
(3) floating number **(4) All of the above**

102. Storage capacity of a 3.5" floppy disk is
(1) 360 kB (2) 1.2 MB
(3) 1.44 MB (4) 2 MB

103. MS-Excel : Text wrap in the selected cell can be done using
(1) Ctrl + Enter **(2) Alt + Enter**
(3) Shift + Enter (4) None of these

104. Main characteristics of MAN –
(1) cover a wider geographic area than LAN
(2) operating speed is very close to LAN
(3) interconnected LAN's located in a city
(4) All of the above are true.

105. _____ is the one of the language used to develop C-programming ?
(1) BCPL (2) BPCL
(3) BCLP (4) BPLC
- **Basic Combined Programming Language**

106. In C-programming identifiers are names given to - (1) Variables (2) Arrays
(3) Functions **(4) All of the above**

107. Which function key is used to start spell check automatically in MS Word ?
(1) F1 (2) F3 (3) F5 **(4) F7**

108. The range of integer for 16-bit computer is
(1) 0 to 255 **(2) –32768 to 32767**
(3) –128 to 127 (4) 0 to 65535

109. CUI full form is
(1) Command – line User Interface
(2) Common – line User Interface
(3) Current – line User Interface
(4) None of the above

110. Mnemonics are used in _____ language.
(1) Machine level language
(2) High level language
(3) Assembly level language
(4) English language

111. A technique of encoding and decoding messages is called
(1) Biography **(2) Cryptography**
(3) Monography (4) Demography

112. Match the following :

1. Clip Board	a. Keep the source formatting
2. One of the paste options	b. Editing options
3. Find and Replace	c. Image
4. Clip Art	d. Holds the copied contents

Choose the right answer from the options given below :

	1	2	3	4
(1)	**d**	**a**	**b**	**c**
(2)	d	a	c	b
(3)	b	d	a	c
(4)	b	d	c	a

113. The formulae = round (8.30, 0) in MS Excel gives
(1) 9 (2) 8.5
(3) 8 (4) 8.6

114. Default left margin in MS-Word is :
(1) 1.0" **(2) 1.25"**
(3) 1.50" (4) 2.0"

115. The smallest and largest font size available in Font size tool on formatting toolbar is :
(1) 6 and 70 **(2) 8 and 72**
(3) 8 and 92 (4) 10 and 100

116. The following alignment option is not available to align the position of text within the margins in MS-Word :
(1) Align Left (2) Align Right
(3) Align Bottom (4) Align Centre

117. How to select one hyperlink after another during a slide presentation in MS Power Point ?
(1) Ctrl + K (2) Ctrl + D
(3) Tab (4) Ctrl + H

118. Which of the following is not a power point view?
(1) Slide show view (2) Slide view
(3) Presentation view **(4) Outline view**

119. Slide sorter can be accessed from which view? (1) Insert (2) File
(3) Edit **(4) View**

120. Shortcut to insert new slide in the current presentation is :
(1) CTRL + O **(2) CTRL + M**
(3) CTRL + F (4) CTRL + N

121. Which among the following is an important data transfer technique ?
(1) CAD (2) CAM
(3) DMA (4) MMA

122. RISC stands for ?
(1) Risk Instruction Source Computer
(2) Reduced Instruction Set Computer
(3) Risk Instruction Set Computer
(4) Risk Instruction Set Computing

123. The performance of cache memory is named in terms of
(1) Hit ratio (2) Chat ratio
(3) Copy ratio (4) Data ratio

124. Which of the following reads the data by reflecting pulses of laser beams on the surface.
(1) Magnetic Disk (2) Floppy Disk
(3) Optical Disk (4) ROM

125. What is the full form of ISDN
(1) Integrated Services Digital Network
(2) Integrated Services Double Network
(3) Integrated Services Digital Network
(4) Integrated Server Digital Network

126. There is a file extension in the computer ' .png '. What does 'png' stands for ?
(1) Portable Neutral Graphics
(2) Portable Network Graphs
(3) Pretty Network Graphics
(4) Portable Network Graphics

127. The term of network what is the mean of SAP
(1) Smart Access Point
(2) Service Access Point
(3) Service At Point
(4) Service Access Permission

128. The default style for the new data keyed in a new workbook in MS-Excel is ?
(1) Coma **(2) Normal**
(3) Currency (4) Percent

129. Which of the following Keyboard shortcut may be used to create a chart from the selected cells
(1) F11 (2) F10 (3) F9 (4) F2

130. The Cell reference for a page of cells that states in cell C1 and goes over to column H and down to row 10 is ?
(1) C1 : 10H **(2) C1 : H10**
(3) C1: H -10 (4) C1: H : 10

131. Except which of the following function, a formula with a logical function shows the word ' TRUE ' or ' FALSE ' as a result ?
(1) NOT (2) OR
(3) IF (4) AND

132. Macros can be executed from which of the following menu ?
(1) Format (2) Home
(3) Insert **(4) Tools**

133. Which function displays row data in a column and column data in a row?
(1) Transpose (2) Index
(3) Rows (4) Hyperlinks

134. " VLOOKUP " function is used to :
(1) Find related records
(2) Works up text that contain 'V'
(3) Check if two cells are identical
(4) None of the above

135. A function inside another function is known as (1) Round function (2) Sandwich function
(3) Switch function **(4) Nested function**

136. What term refers to a specific set of values saved with the workbook.
(1) Page (2) File Set
(3) Data Set **(4) Scenario**

137. To auto fit the width of a column in MS – Word, one has to do the following:
(1) Double click the left border of the column
(2) Double click the right border of the column
(3) Double click the column header
(4) None of the above

138. In which view back ground colour will not be visible ?
(1) Print layout view (2) Web layout view
(3) Print Preview (4) Reading view

139.Increment operator (+ +) operates on _____ number of operands. Fill in the correct answer.
(1) One (2) Two
(3) Three (4) Four

140. A computer program is generally associated with
(1) Syntax errors (2) Logic errors
(3) Round off errors **(4) Both (1) and (2)**

141. In Microsoft Power Point, two kind of sound effect files that can be added to the presentation are (1) .wav files and .gif files
(2) .jpg files and .gif files
(3) .wav files and .jpg files
(4) .wav files and .mid files

142.An OSI network model has _____ layers.
(1) 5 (2) 6 **(3) 7** (4) 8

143. Which of the following is an example of binary number.
(1) A I B C D I (2) 23412
(3) 100101 (4) All of the above

144. The basic unit of a worksheet into which you enter data in excel is called
(1) Cell (2) Table
(3) Box (4) Field

145. A website's main page is called
(1) Home Page (2) Bookmark
(3) Browser page (4) Search page

146. Which of the following is true about firewalls (1) Follow a set of rules
(2) Can be either hardware or software device
(3) Filters Network Traffic
(4) All of the above

147. USB is which type of storage device ?
(1) Binary **(2) Secondary**
(3) Tertiary (4) None of the above

148. Which program is run by BIOS to check hardware components are working properly while computer is turn on ?
(1) DMOS **(2) POST**
(3) CMOS (4) RIP

149. Which type of storage device is BIOS ?
(1) Primary (2) Secondary
(3) Tertiary (4) Not a storage device

150. Which one is not the correct method of editing the cell content in MS-Excel ? Choose from the following :
(1) Press the Alt Key
(2) Press the F2 Key
(3) Double click the cell
(4) Click the formula Bar

151. How many maximum columns can be inserted in MS-Word document ?
(1) 40 **(2) 63** (3) 50 (4) Unlimited

152. What is the default font size of new word document based on normal template ?
(1) 8 pt (2) 10 pt

(3) 12 pt (4) 14 pt

153.Which of the following line spacing is invalid ? (1) Single (2) Double
(3) Triple (4) Multiple

154. Which one of the following is a token of C-Language ?
(1) Scanf ( ) (2) Strlen ( )
(3) typedef (4) Clrscr ( )

155. Consider the following statements :
A. In MS Excel, each workbook by default has 3 number of worksheets.
B. In MS Excel, the formulae start with " = " sign.
Which of the above is/are correct ?
Select the code for the correct answer from the options given below :
(1) A only (2) B only
(3) Both A and B (4) Neither A nor B

156. The most widely used code that represents each character as a unique 8-bit code is
(1) ASCII (2) UNICODE
(3) BCD (4) EBCDIC

157. Bandwidth refers to which of the following ? (1) The amount of information a peer-to-peer network can store.
(2) The amount of information a communication medium can transfer in a given time.
(3) Conversion rate of analog signals to digital signals and vice versa.
(4) The cost of cable required to implement LAN or WAN in an area.

158. Who is the founder of Pascal programming language ?
(1) Grace Hopper **(2) Niklaus Wirth**
(3) Thomas E. Kurtz (4) Michael J. Carey

159. Which of the following is a crucial activity attempting to acquire sensitive information such as passwords, credit cards, debit cards by masquerading as a trustworthy person or business in an electronic communication ?
(1) Spoofing **(2) Phishing**
(3) Stalking 4) Hacking

160. In Network computers are connected to the same cable in which of the following topologies ?
(1) Star (2) Ring
(3) Bus (4) Mesh

161. .tmp extension usually refers to what kind of files ?
(1) Compressed archive files (2) Image files
(3) Temporary files (4) Audio files

162. Who is a 'White Hat' ?
(1) Hacker who breaks security for authentic or at least non-malicious reasons.
(2) Hacker of ambiguous ethics or borderline loyalty, often frankly admitted.
(3) Someone outside computer security consulting firms that are used to bug test a system prior to its launch, looking for exploits so they can be closed. (4) None of the above

163. Which of the following shortcuts is used to insert bullets in MS Word ?
(1) Ctrl + Shift + L (2) Ctrl + L
(3) Ctrl + Shift + I (4) Ctrl + Shift + S

164. Match the MS Excel function key shortcut (List I) with the corresponding actions (List II) :
A. F1 I. Activates the selected cell for editing
B. F2 II. Opens the help menu
C. F4 III. Performs spell check in selected range
D. F7 IV. Repeats last action
V. Refreshes workbook. Performs calculations on formula Select the code for the correct answer from the options given below

	A	B	C	D
(1)	**II**	**I**	**IV**	**III**
(2)	I	III	V	IV
(3)	V	IV	III	II
(4)	II	III	I	V

164. Which of the following is true about ENIAC ? (1) It was developed by Charles Babbage
(2) It was the first stored-program electronic digital computer
(3) It was an electromechanical computer
(4) It used vacuum tubes

165. Consider the following statements :
A. 4 Bits make one Nibble.
B. 1 Megabyte is equal to 1024 Kilobytes.
C. 1 Terabyte is equal to 1024 Gigabytes (GB).? Select the code for the correct answer from the options given below :
(1) A and C only (2) A and B only
(3) B and C only **(4) A, B and C**

166. Which of the following is the octal number equivalent to the binary number (110101)2 ?
(1) 12 **(2) 65**
(3) 56 (4) None of the above

167. The E-R diagram is a graphic method of presenting
(1) Primary keys and their relationships
(2) Primary keys and their relationship to instances **(3) Entity classes and their relationships**
(4) Entity classes and their relationship to primary keys

168. A packet filtering firewall operates at which of the following Open System Interconnection (OSI) layers ?
(1) At the application layer
(2) At the transport layer
(3) At the network layer
(4) At the gateway layer

169. Consider the following :
A. Bit B. Bytes C. Field
D. Record E. File F. Database
What is the ascending order of data hierarchy ? Select the code for the correct answer from the options given below :
(1) A B C D E F
(2) B A C D E F
(3) A B D C E F
(4) B A D C E F

170. What is 'Fork' ?
(1) The dispatching of a task.
(2) The creation of a new job.
(3) The creation of a new process.
(4) Increasing the priority of a task.

171. Consider the following diagrams of logic gates : Which of the following is correct ?

A. 

B. 

(1) A is AND and B is OR
(2) A is AND and B is NOR
(3) A is NAND and B is OR
(4) A is NAND and B is NOR

172. Which of the following is not a PowerPoint view ?
(1) Slide Show View (2) Slide View
(3) Presentation View (4) Outline View

173.The Clock Speed of a Processor is Specified in
(1) GFLOPS **(2) GHz**
(3)GB (4)GBPS

174. Which page setup feature can be used to create a newspaper like document in MS word?
1) Margins 2) Tables
3) Columns 4) Paper Source

175. Shortcut Key is Used to find Current Date in MS Excel?
1) CTRL +; 2) F7
3) CTRL + H 4) CTRL + :

176. MS Excel , to Treat numeric data as text , it should be preceded by_____symbol.
1) Semi Colon(;)
2) Exclamation Mark(!)
3) Apostrophes(')
4) #

177. What is the earliest date MS Excel understands?
1) January 1,1000 **2) January 1,1900**
3) January 1,2000 4) January 1,1100

178. In Computer System, interpretation of an instruction is done by?
1) ALU 2) Memory Unit
3) Control Unit 4) Input Unit

179) A Key logger antivirus is typical example for____
1) Trojan **2) Spyware**
3) Worm 4) Logic Bomb

180. Nudi from 6.0 is based on
1) Front –encoding **2) Unicode**
3) BCD 4) Excess

181. The _____Memory is Places between the ram and the CPU.
1) Registers **2) Cache Memory**
3) ROM 4) None of these

182. The Time for which a piece of window device works is called
1) Access Time 2) Seek Time
3) Real Time 4) Effective Time

183. Dimension of Letter Size document in MS word is
1) 8 inch x 11 inch
2) 8.5 inch x 11.5 inch
3) 8 inch x 11.5 inch
4) 8.5 inch x 11 inch

184._____Connects two network that uses different protocol.
1) Gateway 2) Bridge
3) Hub 4) Switch

185.Which Protocol is used to retrieve email message from the server to your computer.
1) HTTP 2) SMTP
3) POP3 4) POP

186. Which Computer Scientist discover Phishing Term?
1) John Hopkins **2) Khan B Smith**
3) Charles Babbage 4) Alan Tuning

187. By default How many Work sheets are available in MS Excel Workbook
1) 3 2) 1 3) 4 4) 2

188. Which is the Basic Unit in MS Excel?
1) Table **2) Cell**
3) Worksheet 4) Workbook

189. Which of the Following in not a pert of slide design in power point?
1) Animation Scheme 2) Design Template
3) Slide Layout 4) Color Scheme

190. The number of bits a computer can process at a once is called a
1) Nibble **2) Word**
3) Bit Sequence 4) Byte

191. The Logic gate that Provides High output for same input is
1) AND 2) Not Gate 3) XOR **4) X-NOR**

192. Negative numbers are represented in Computers by
1) Sign and Magnitude 2) 1' Complement 3) ASCII **4) 2' Complement**

193. An Absolute Cell Reference in MS Excel is.
1) # a # 1 2) ! A ! 1 3) A 1 **4) $ A $ 1**

194. Short cut key in MS Word to "Insert a Hyperlink" in a document
1) Ctrl + L **2) Ctrl + K** 3) Ctrl + I 4) Ctrl + M

195. Which of the following is not available in MS Word font Spacing
1) Condensed **2) Loosely** 3) Expanded 4) Normal

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