



## COMPUTER CAPSULE FOR IBPS CLERK MAINS 2017

### History

The word Computer in earlier times meant a person who performed calculations or computations. With years its definition changed to a machine that performs calculations. It can perform all type of mathematical and logical

operations; it can accept data, store data, retrieve data, process data and produce output.

**Charles Babbage** was known as father of computer. He invented two machines in 1822 introduced **Difference Engine** and in 1834, introduced **Analytical engine**

Difference Engine	Charles Babbage	First automatic mechanical calculator
Analytical Engine	Charles Babbage	Mechanical general-purpose computer
Z1	Konrad Zuse	World's first freely programmable computer
MARK-1	Konrad Zuse	First Freely programmable Computer
ENIAC	John W. Mauchly and J. Presper Eckert	First general purpose programmable electronic computer
EDSAC	John von Neumann	First computer to store program
EDVAC	John W. Mauchly and J. Presper Eckert	Binary serial computer
UNIVAC	John W. Mauchly and J. Presper Eckert	First general-purpose computer for commercial use
Intel 4004	Intel	First commercially available microprocessor by Intel, a 4-bit CPU
LISA(Local Integrated Software Architecture)	Apple Inc.	First commercial personal computers to have a GUI
Dataphone	AT&T	First AT&T Commercial modem
ARPANET	United States Department of Defence	Early packet switching network and the first network to implement the protocol suite TCP/IP.
NEXUS Browser (WorldWideWeb)	Tim Berners-Lee	First Web Browser was WorldWideWeb later named Nexus. The first commonly available web browser with a graphical user interface was <b>Erwise</b> .
Six Degrees		First social networking/ social media site

**ENIAC was the first digital computer** and it was invented by J.Presper Eckert and John Mauchly at the University of Pennsylvania and began construction in 1943. It uses 18000 vacuum tubes as a storing device. They were also founders of the first computer company, it was initially named Electronic Controls Company which was later changed to **Eckert-**

**Mauchly Computer Corporation**, and released a series of mainframe electronic digital stored-program computer under the name of **UNIVAC**.

MIT introduces the **whirlwind** machine (first computer with RAM) on March 8, 1955.

### Generation of computer

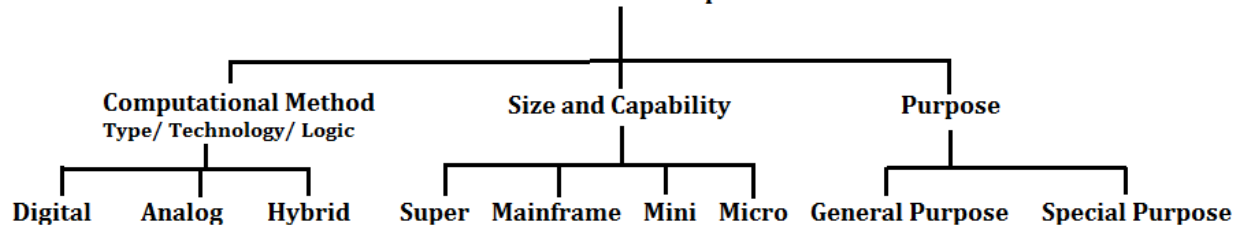
Subject	1 <sup>st</sup> generation	2 <sup>nd</sup> generation	3 <sup>rd</sup> generation	4 <sup>th</sup> generation	5 <sup>th</sup> generation
Period	1940-1956	1956-1963	1964-1971	1971-present	present & beyond
Circuitry	Vacuum tube	Transistor	Integrated chips (IC)	Microprocessor (VLSI)	ULSI (Ultra Large Scale Integration) technology
Memory Capacity	20 KB	128KB	1MB	Semiconductor type and very high	VLSI and ULSI
Processing Speed	300 IPS inst. Per sec.	300 IPS	1MIPS(1 million inst. Per sec.)	Faster than 3 <sup>rd</sup> generation	Very fast

## COMPUTER CAPSULE FOR IBPS CLERK MAINS 2017

Programming Language	Assembly Language	High level language (FORTRAN, COBOL, ALGOL)	C,C++	C,C++,Java	All the Higher level languages, Neural networks,
Example of computers	UNIVAC, EDVAC	IBM 1401, IBM 7094, CDC 3600,D UNIVAC 1108	IBM 360 series, 1900 series	Pentium series Multimedia, Stimulation	Artificial Intelligence, Robotics

### Types of computer

#### Classification of Computers



**Analog computer** introduced by Lord Kelvin. Numerical data are represented by measurable physical variables such as electrical voltage. A thermometer is a simple analog computer.

**Digital computer** that accepts and process data in the form of numbers and all the character are converted into binary code.

**Hybrid computer** used the combined feature of analog and digital machine. you can see hybrid computer in geological departments.

**Microcomputer** these are small relatively inexpensive computer designed for personal and office use. It has lowest storing and processing speed. These can be laptop or desktop.

**Minicomputer** powerful as compare to microcomputer it has higher memory provide faster operating speeds and large storage capacities than microcomputers. It can be used as a server and capable of supporting from 2 to 200 users.

**Mainframe computer** it has very high memory and processing speed and used as a server (can support thousands of users)

**Super computer** can be used for complex type of application i.e. specific research, weather forecasting, Weapon designing etc.

**CDC 6600** was the first successful supercomputer.

**Sunway Taihu Light** of China is the fastest supercomputer in the world.

**PARAM-8000** India's first Super Computer developed by C-DAC Pune in 1998.


**Shasra T** is considered as **India's fastest super computer**, manufactured by Indian Institute of Science.

**Servers** are dedicated computers that serve the needs or request of other programs or computer.

**Workstations** serve usually one user only.

**Information appliances** are computers specially designed to perform a specific "user-friendly" function—such as playing music, photography.

**An embedded system** is a computer system with a dedicated function within a larger system.



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### Hardware and I/O Devices

A computer is an electronic device that accepts data from the user (input), processes the data by performing calculations and operations on it and generates the desired Output.

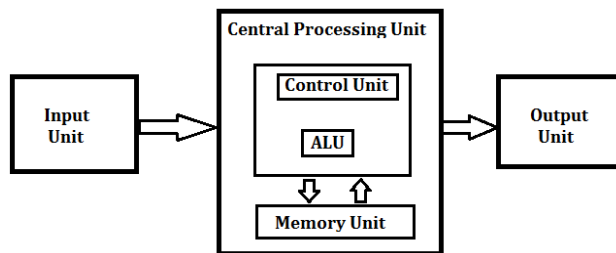
An unprocessed collection or representation of raw facts represented in a manner suitable for communication,

interpretation or processing by humans or by automatic means, is known as **Data**.

Personal computers use a number of chips mounted on a main circuit board called **Motherboard**. A motherboard is the physical arrangement in a computer that contains the computer's basic circuitry and components.

An **output device** is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) which converts the electronically generated information into human-readable form.

The CPU is fabricated as a single Integrated Circuit (IC) chip. It is also known as the **Microprocessor**. Multiprocessor Computers uses two or more central processing units (CPUs) within a single computer system. The term also refers to the ability of a system to support more than one processor and/or the ability to allocate tasks between them.



The **central processing unit (CPU)** is the brain of your computer. It handles all the instructions you give your computer. The **control unit (CU)** is a component of a computer's central processing unit (CPU) that directs operation of the processor. It tells the computer's memory, arithmetic/logic unit and input and output devices how to respond to a program's instructions.



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An **arithmetic logic unit (ALU)** is a digital circuit used to perform arithmetic and logic operations. It represents the fundamental building block of the central processing unit (CPU) of a computer.

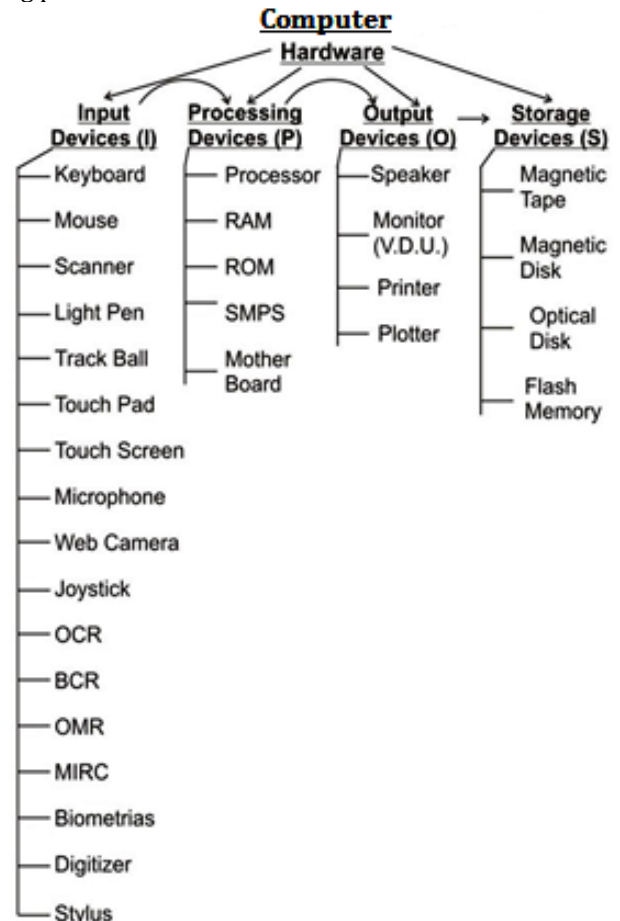
**Instruction Execution:** the program which is to be executed is a set of instruction which are stored in memory. The CPU executes the instructions of program to complete a task and this execution takes place inside the CPU with the help of registers ALU (arithmetic logic unit) and CU(control unit). When the processor executes instructions, data is temporarily stored in small local memory location and these are called registers.

**Accumulator Register:-** which stores the immediate result of arithmetic and logical operations.

**Memory address register (MAR) :-** which contain the address of memory location to which data is to be stored.

**Program counter :-** which contain the address of the next instruction to process.

**Instruction register:-** which contain the current instruction being processed



The data that is fed into a computer processor, received into the computer by a keyboard or other sources is called **Input**. Examples of input devices include keyboards, mouse, scanners, digital cameras and joysticks.

A **keyboard** is a typewriter-style device, which uses an arrangement of buttons or keys, to act as mechanical levers or electronic switches. Most of the commonly available personal computers have a keyboard, popularly known as Qwerty.

Function Keys	F1-F2
Toggle Keys	Caps Lock, Num Lock,
Modifier Keys	Shift, Alt, Ctrl, Fn
Alphanumeric Keys	A-Z, 0-9

'Caps lock' and 'Num lock' keys are called as **Toggle Keys** because when pressed, they change their status from one state to another.

**Numeric Keypad** is a keypad located on the right hand side of the keyboard. It consists of digits and mathematical operators.

A **Modifier key** is a special key (or combination) on a computer keyboard that temporarily modifies the normal action of another key when pressed together. By themselves, modifier keys usually do nothing; that is, pressing any of the Shift, Alt, or Ctrl keys alone does not (generally) trigger any action from the computer.

A **Mouse** is the most popular input device which is used today for interactive processing and for the one line entry of data for batch processing. The first computer mouse was invented by **Douglas Engelbart**.

Drag and Drop refers to the action of clicking and holding down the mouse button, while moving the mouse and then releasing the mouse button.

**Joystick** is the device that moves in all directions and controls the movement of a pointer.

A **Touch Screen** is a type of display screen device that is placed on the computer monitor to allow direct selection or activation of the computer when the user touches the screen. It acts as both input and output device.

**Light Pen** is the pen shaped device, which can sense light and is used to point at spots on a video screen.

A technology enables a high-speed reading of large quantities of data and transferring these data to the computer without using a keyboard. It is referred as **Optical**

**Mark Reader (OMR)**. It uses a beam of light that is reflected on the paper with marks, to capture presence and absence of marks.

**MICR** reads the characters by examining their shapes in a matrix form and the information is then passed on to the computer. MICR stands for **Magnetic Ink Character Reader**. It provides a high level of security and is therefore used by the banking industry for faster processing of the cheque.

**Bar Code** is a machine readable code, which is represented by parallel vertical lines with varying widths. For reading these bar-coded data, a device is used, which is known as a Bar Code Reader (BCR)

**Optical Character Recognition (OCR)** is used to scan the document containing text. It is the mechanical or electronic conversion of scanned or photographed images of typewritten or printed text into machine-encoded/computer-readable text.

A **point of sale terminal (POS terminal)** is an electronic device used to process card payments at retail locations.

The device that prints information from the computer onto the paper is **Printer**.

The printed form of output is referred as **Hard Copy**. The form of output displayed on the screen is referred as **Soft Copy**.

**Pages per Minute (PPM)** is the unit used to count the speed of the printer.

On the basis of technology, printers are categorized into **Impact and Non-Impact Printers**.

**Impact printers** create an image by using some mechanism to physically press an inked ribbon against the page, causing the ink to be deposited on the page in the shape desired.

**I) Dot matrix :-** The dot-matrix printer uses print heads containing from 9 to 24 pins. These pins produce patterns of dots on the paper to form the individual characters

**II) Daisy wheel:-** A hammer strikes a "petal" containing a character against the ribbon, and the character prints on the paper. Its speed is slow typically 25-55 characters per second.

**III) Line printer:-** Line printers, or line-at-a-time printers, use special mechanism that can print a whole line at once; they can typically print the range of 1,200 to 6,000 lines per minute

**IV) Drum printer:-** A drum printer consists of a solid, cylindrical drum that has raised characters in bands on its surface. The number of print positions across the drum equals the number available on the page.

**V) Chain printer:-** A chain printer uses a chain of print characters wrapped around two pulleys

**VI) Band printer:-** Band printer has a steel band divided into five sections of 48 characters each.

**Non - Impact Printers** do not touch the paper when creating an image.

**I) Ink-jet printers:-** One or more nozzles in the print head emit a steady stream of ink drops. Droplets of ink are electrically charged after leaving the nozzle. The droplets are then guided to the paper by electrically charged deflecting plates

**II) Laser printers:-** Laser printers use buffers that store an entire page at a time. When a whole page is loaded, it will be printed.



**III) Thermal printer:-** is a digital printing process which produces a printed image by selectively heating coated thermo chromic paper, or thermal paper as it is commonly known, when the paper passes over the thermal print head.

A **plotter** is an output device that interprets commands from a computer to make line drawings on paper with one or more automated pens. Unlike a regular printer, the plotter can draw continuous point-to-point lines directly from vector graphics files or commands.

An **uninterruptible power supply (UPS)** is a device that allows a computer to keep running for at least a short time when the primary power source is lost.

A **Monitor** is a TV-like display attached to the computer on which the output can be displayed and viewed. It can either be a monochrome display or a color display. The number of pixels displayed on a screen is known as **Resolution**.



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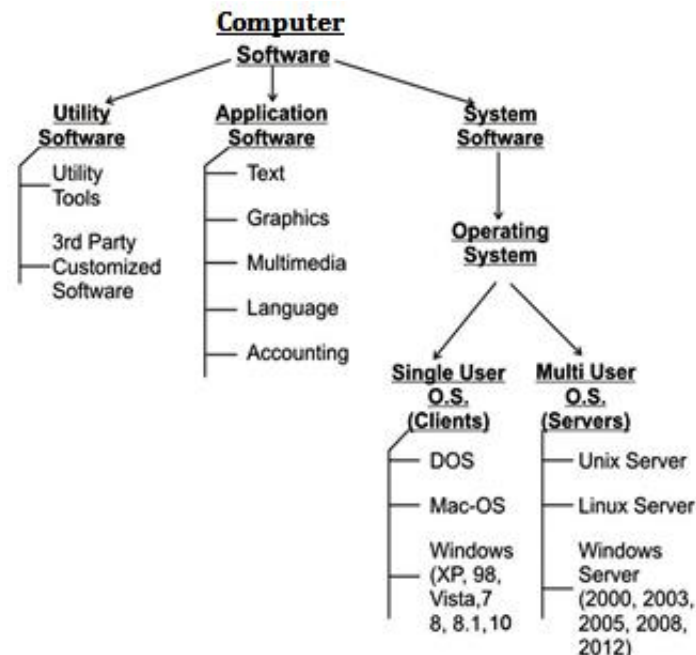
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## Software and Operating System

A set of instructions that tells the computer about the tasks to be performed and how these tasks are to be 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.



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

**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 application programs.

**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 a computer system. **Main functions of operating system are :-**

- Process management
- Memory management
- File management
- Security
- Command and interpretation
- Resource allocation

Types of OS.

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

**2)Multiprogramming operating system :** It allows the 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)Real Time 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 take a very small fraction of time, only a little CPU time is needed for each user.

7) **Mobile OS: Windows 10 Mobile** is the latest name for Microsoft'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**.

## Computer Languages

**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 'MOV A.'

**High level language programmer** can write code in simple easy language, it is user friendly . E.g. C, JAVA

**C language:** it is a middle level programming language and also known as procedural language

**C++** is high level language that uses the OOPS concept.

**Fortran:** it is known as formula translation. It is used for scientific application

**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.

**Simula** was the first object-oriented programming language.

**Java, Python, C++, Visual Basic .NET and Ruby** are the most **popular Object Oriented Programming languages**.

The Java programming language is designed especially for use in distributed applications on corporate networks and the Internet. Ruby is used in many Web applications. **Curl, Smalltalk, Delphi and Eiffel** are also examples of object-oriented programming languages.

**Language processor (Translator):** Programmers write their program in one of the high level language because it is

much easy to code in these language but computer does not understand any of these language so it is necessary to convert program into a machine language so translator do this work.

**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.

**Interpreter** converts high level language program into machine language. It is very slow because it convert program line by line.

**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.

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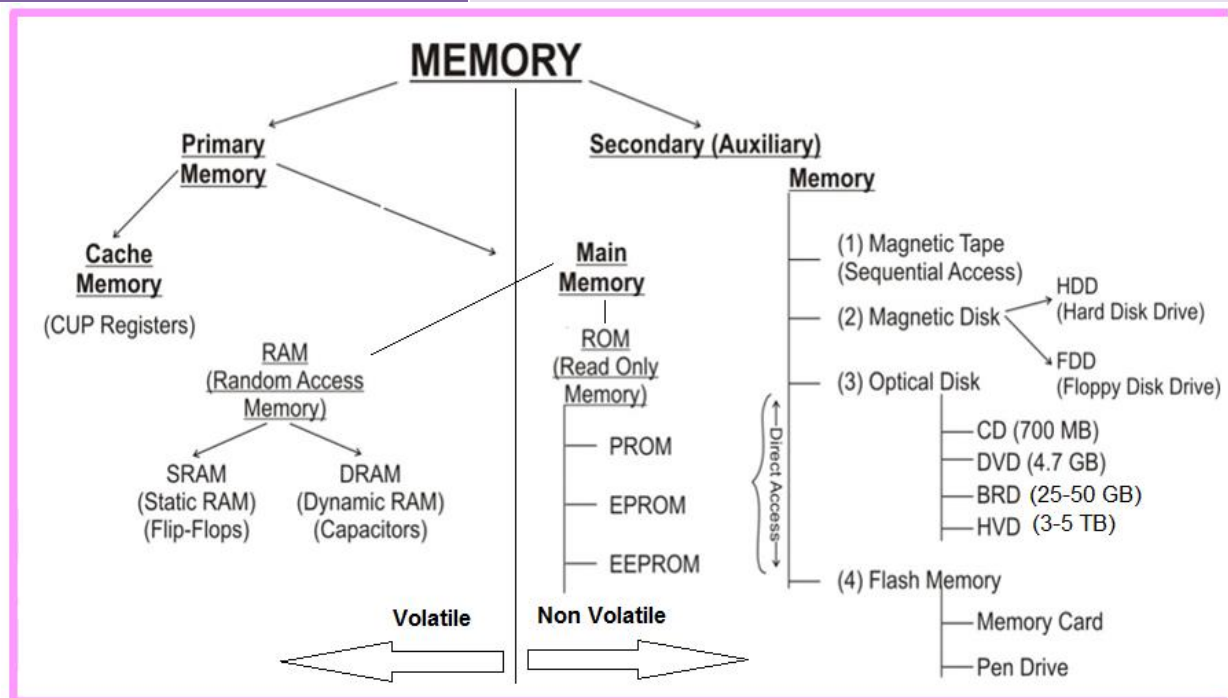
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## MEMORY MANAGEMENT

8 bit	1 byte
1024 Byte	1 KB (Kilo Byte)
1024 KB	1 MB (Mega Byte)
1024 MB	1 GB (Giga Byte)
1024 GB	1 TB (Tera Byte)
1024 TB	1 PB (Peta Byte)
1024 PB	1 EB (Exa Byte)

1024 XB	1 ZB (Zeta Byte)
1024 ZB	1 YB (Yota Byte)



A group of 4 bits is called a **nibble**. A byte is also known as an **Octet**.

**Primary Storage (memory)**, also known as main storage and 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, also known as auxiliary storage.

**Cache memory** 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.

**Secondary memory** 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.

**Read-only memory (ROM)** is a storage medium used in computers and other electronic devices. Data stored in ROM can 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 memory chip 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 special device called a PROM programmer or PROM burner.

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

**EEPROM** - (electrically erasable programmable read-only memory). 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 of what 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.

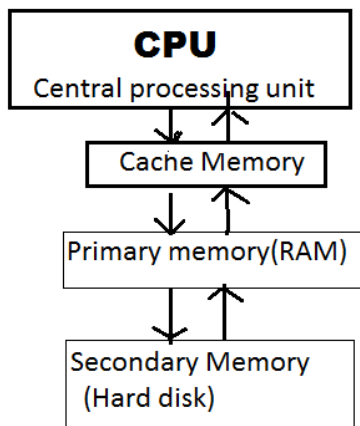
The two main types of RAM are **Static RAM** and **Dynamic RAM**.

**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.



	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:

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

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

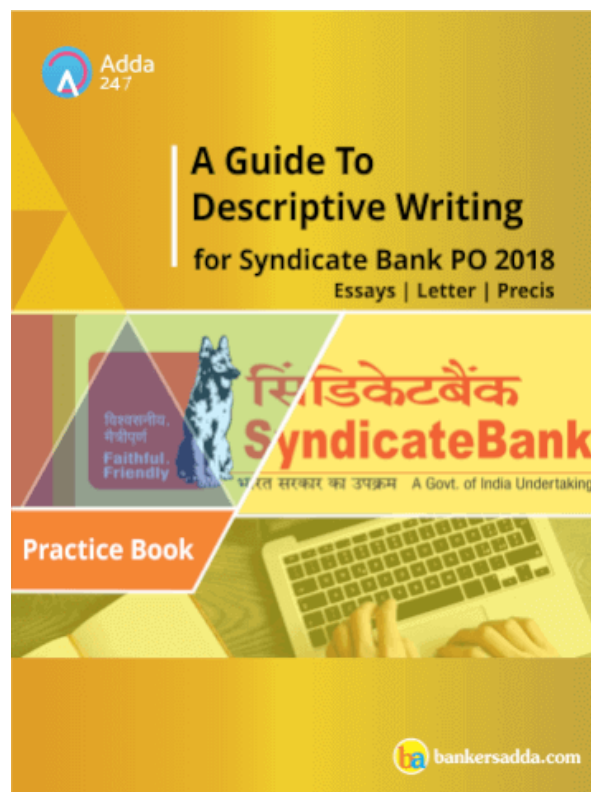
**Optical memory**:-such as computer disk, DVD and blue-ray disk.

A **bus**, in computing, is a set of physical connections (cables, printed circuits, etc.) which can be shared by multiple hardware components in order to communicate with one another.

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.

The **control bus** (or command bus) transports orders and synchronisation signals coming from the control unit and travelling to all other hardware components. It is a bidirectional bus, as it also transmits response signals from the hardware.



## Number System

The **radix or base** is the number of unique digits, including zero, used to represent numbers 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.

### Number System

Decimal, Binary, Octal and Hexadecimal Equivalents			
Decimal	Binary	Octal	Hexadecimal
0	0000	000	0
1	0001	001	1
2	0010	002	2
3	0011	003	3

4	0100	004	4
5	0101	005	5
6	0110	006	6
7	0111	007	7
8	1000	010	8
9	1001	011	9
10	1010	012	A
11	1011	013	B
12	1100	014	C
13	1101	015	D
14	1110	016	E
15	1111	017	F



**Hexadecimal to Binary:** Refer the above table for the conversion process

$$(1A2)_{16} = (?)_2$$

$$1=0001, A=1010, 2=0010; \text{ Hence } (1A2)_{16} = (000110100010)_2$$

**Decimal to Binary:**  $(75)_{10} = (?)_2$

Divide 75 by 2 (and write down its remainder).

	75	
2	37	1
2	18	1
2	9	0
2	4	1
2	2	0
2	1	

$$\text{Hence } (75)_{10} = (101011)_2$$

**Any number system to decimal:**

Sum of all (Digit  $\times$  (Base)<sup>Base's Place</sup>)

Example:  $(1A2)_{16} = (?)_{10}$  (From the table you can refer A is equivalent to 10)

$$((1 \times 16^2) + (10 \times 16^1) + (2 \times 16^0)) = 256 + 160 + 2 = 418$$

Example:  $(110110)_2 = (?)_{10}$

$$((1 \times 2^5) + (1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)) = 32 + 16 + 4 + 2 = 54; (110110)_2 = (54)_{10}$$

**Octal to Binary:**  $(345)_8 = (?)_2$  (Write down 3 bit binary equivalents of all digits)

$$3=011, 4=100, 5=101; \text{ Hence } (345)_8 = (011100101)_2$$

**Octal to Hexadecimal:** Convert to Binary first and then group 4 bits to get hexadecimal number. Example:  $(345)_8 = (?)_{16} \Rightarrow (345)_8 = (011100101)_2 = 0000\ 1110\ 0101 = (0E5)_{16}$

## Computer Network

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

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).

A **MAN (metropolitan area network)** is a larger network that usually spans several buildings in the same city or town.

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. The Internet is an example of a worldwide public WAN.

A **personal area network (PAN)** is a computer network used for data transmission amongst devices such as computers, telephones, tablets and personal digital assistants.

**Campus Area Network or corporate area network** is a computer network made up of an interconnection of local area networks (LANs) within a limited geographical area.

A **Storage Area Network (SAN)** is a specialized, high-speed network that provides block-level network access to storage.

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.

### Networking Devices

**Modem:** Modem stands for Modulator-Demodulator. It is used to connect computers for communication via telephone lines.

**Hub:** It works at the Physical layer. It just acts like a connector of several computers i.e. simply connects all the devices on its ports together. It broadcasts all the data packets 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 provides filtering of data packets and prevents network traffic also.

**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.

**Router:** 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 reducing network traffic.

**Gateway:** It operates in all the layers of the network architecture. It can be used to connect two different networks having different architectures, environment and even models.

**Bridge:** They are used to 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.

IPv4 - 32 bits numeric address

IPv6 - 128 bits hexadecimal address

**IPv6** does not use broadcast messages and has three types of addresses, which are categorized as :

**Unicast** addresses. A packet is delivered to one interface.

**Multicast** addresses. A packet is delivered to multiple interfaces.

**Anycast** addresses. A packet is delivered to the nearest of multiple interfaces (in terms of routing distance).

With an IPv4 IP address, there are five classes of available IP ranges: Class A, Class B, Class C, Class D and Class E, while only A, B, and C are commonly used. Each class allows for a particular range of valid IP addresses. Class D is reserved for multicast groups and Class E is reserved for future use, or Research and Development Purposes.

**Data Communication** deals with the transmission of digital data from one device to another. Data is transferred through a 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 one side and a designation or receiver at another side of the network. The source of data origination is single but there may be multiple receivers. A communication channel is of 3 types:

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

**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.**

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

The **Open Systems Interconnection model (OSI)** is a conceptual model that characterizes and standardizes the internal functions of a communication system by partitioning it into abstraction layers. The model is a product of the Open Systems Interconnection project at the **International Organization for Standardization (ISO)**.


7	<b>APPLICATION LAYER</b> (Network Process to Application)	Data
6	<b>PRESENTATION LAYER</b> (Data Representation & Encryption)	Data
5	<b>SESSION LAYER</b> (Inter-host Communication)	Data

4	<b>TRANSPORT LAYER</b> (End-to-end connections & reliability)	Segments
3	<b>NETWORK LAYER</b> (Path Determination and IP)	Packets
2	<b>DATA LINK LAYER</b> (Physical Addressing)	Frames
1	<b>PHYSICAL LAYER</b> (Media, Signal and Binary Transmission)	Bits




**Network topology** is the arrangement of the various elements (links, nodes, etc.) of a computer network. There are two basic categories of network topologies:

≈ Physical topologies and Logical topologies.

**Physical topology** is the placement of the various components of a network, including device location and cable installation, while **Logical topology** illustrates how data flows within a network, regardless of its physical design. Various types of topologies are:



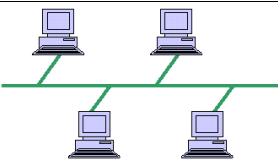
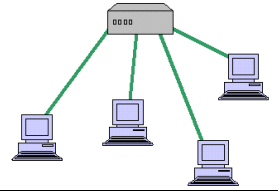
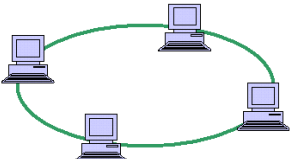
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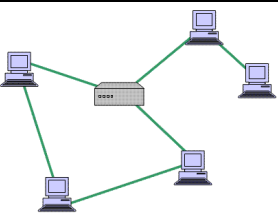
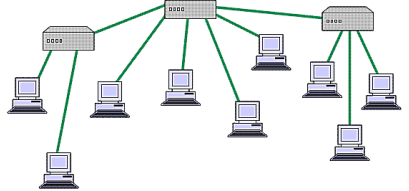




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<b>Bus Topology</b>		Every computer and network device is connected to single cable.
<b>Star Topology</b>		All the computers are connected to a single hub through a cable. This hub is the central node and all others nodes are connected to the central node.
<b>Ring Topology</b>		Each computer is connected to another computer, with the last one connected to the first. Exactly two neighbors for each device.

<b>Mesh Topology</b>		It is a point-to-point connection to other nodes or devices. All the network nodes are connected to each other
<b>Tree Topology</b>		It has a root node and all other nodes are connected to it forming a hierarchy. It is also called hierarchical topology.

**Hybrid topology** uses a combination of any two or more topologies in such a way that the resulting network does not exhibit one of the standard topologies.

**Cloud computing** is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand.

**Public clouds** are owned and operated by companies that offer rapid access over a public network to affordable computing resources.

A **private cloud** is infrastructure operated solely for a single organization, whether managed internally or by a third party, and hosted either internally or externally.

A **hybrid cloud** uses a private cloud foundation combined with the strategic integration and use of public cloud services.

Google Drive is a personal cloud storage service from Google which gives every user 15 GB of Drive storage space. OneDrive is Microsoft's service for hosting files in the "cloud computing". OneDrive offers 5GB of storage space for free.

## Internet

The **Internet** is a global system of interconnected computer networks 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 broad array of electronic, wireless, and optical networking technologies.

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

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.

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 with various 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 a web browser starts or when the browser's "home" button is pressed; this is also called a "home page". The user can

specify the URL of the page to be loaded, or alternatively choose e.g. to re-load the most recent web page browsed.

- A personal web page, for example at a web hosting service or a university web site that typically is stored in the home directory of the user.

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.

Some of the famous browsers are **Safari, Chrome, Firefox, Bolt, UC Browser and Internet Explorer**

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.

(i) **An example of a typical URL** would be "http://www.bankersadda.com".

Here the **domain name** is 'bankersadda.com'

**Downloading** means to 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 names** are used to identify one or more IP addresses.

The **universal resource locator**, or URL, is an entire set of directions, and it contains extremely detailed information. The domain name is one of the pieces inside of a URL.

Domain Types	
Type	Description
com	Commercial and for profit organization
edu	Educational provider, college, Universities
gov	Government agencies
Mil	US military sites
net	Internet infrastructure and service providers
org	Miscellaneous and Non-profit organisations

An **email attachment** is a computer file sent along with an email message. One or more files can be attached to any email message, and be sent along with it to the recipient.

**Hotmail** was co-founded by an Indian American entrepreneur Sabeer Bhatia along with Jack Smith in July of 1996

**CC (Carbon Copy)** in e – mail indicates those who are to receive a copy of a message addressed primarily to another. The list of CC recipients is visible to all other recipients of the message.

An additional **BCC (blind carbon copy)** field is available for hidden notification; recipients listed in the BCC field receive a copy of the message, but are not shown on any other recipient's copy (including other BCC recipients)

The **Drafts folder** retains copies of messages that you have started but are not yet ready to send.

The first email was sent by **Ray Tomlinson** to himself in 1971.

Internet Explorer was deprecated in Windows 10, with **Microsoft Edge** replacing it as the default web browser.



## Computer Security

A **Computer Virus** is a computer program or code that can replicate itself and spread from one computer system to another system. A computer virus has the capacity to corrupt or to delete data on your computer and it can utilize an e-mail program to spread the virus to other computer systems. In the worst case scenario, it can even delete everything on your hard disk. The purpose of it is to disrupt the operation of the computer or the program.

Some examples of Computer Virus are **Trojan viruses, Stealth viruses, worms, malware (malicious software), Disk Killer, Stone virus, Sunday, Cascade, Nuclear, Word Concept, etc.**

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

**Antivirus Software** is used to scan the hard disk to remove the virus from them. Some of the famous anti – viruses available are Avast, Norton, Avira, Kaspersky, AVG, etc.

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**.

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

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



**Phishing** is the attempt to acquire sensitive information such as usernames, passwords, and credit card details (and sometimes, indirectly, money) by masquerading as a trustworthy 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.

## Microsoft 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.

## MS WORD

Microsoft Word is a word processor developed by Microsoft.

It is used for creating, editing, formatting, storing, retrieving and printing of a text document.

Microsoft Word's native file formats are denoted either by a **.doc** or **.docx** file extension.

A **Cursor** is an indicator used to show the position on a computer monitor or other display device that will respond to input from a text input or pointing device.

Home	Clipboard, Font, Paragraph, Styles, Editing
Insert	Pages, Tables, Illustrations, Links, Header & Footer, Text, Symbols(and Equations)
Page Layout	Themes, Page Setup(includes margins, orientation, breaks etc.), Page Background(includes watermark and borders), Paragraph, Arrange
References	Table of Content, Footnotes, Citation and Bibliography, Captions, Index, Table of Authorities
Mailings	Create(Envelops & Labels), Start Mail Merge
Review	Proofing( Spelling & Grammar, Research, Thesaurus, Word Count), Language(and Translate), Comments, Tracking, Changes, Compare, Protect
View	Document Views, Show, Zoom, Window, Macro
Design	Table Style Options, Table Styles, Draw Borders
Layout	Tables, Rows & Columns, Merge, Cell Size, Alignment, Data

### Basic Keys (Common Tasks)

<b>Ctrl + N</b>	Create a new document
<b>Ctrl + B</b>	Make letters bold
<b>Ctrl + I</b>	Make letters italic
<b>Ctrl + U</b>	Make letters underline
<b>Ctrl + Shift+ &lt;</b>	Decrease font size one value
<b>Ctrl + Shift + &gt;</b>	Increase the font size one value

<b>Ctrl + [</b>	Decrease the font size by 1 point
<b>Ctrl + ]</b>	Increase the font size by 1 point
<b>Ctrl+ Spacebar</b>	Remove paragraph or character formatting.
<b>Ctrl + C</b>	Copy the selected text or object
<b>Ctrl + X</b>	Cut the selected text or object
<b>Ctrl + V</b>	Paste text or an object
<b>Ctrl + Alt + V</b>	Paste special
<b>Alt+ Ctrl + S</b>	Split the document Window
<b>Ctrl + Z</b>	Undo the last action
<b>Ctrl + Y</b>	Redo the last action

To create a document, we use **New command** at the menu.

**Save as** is used to save a document for the first time. It is also used to change the destination of the saved file in the computer.

**Print Preview** is used to see the document before the printout is taken.

**Cut and Paste** options are used to move the data from one part of the document to another.

### Control Keys + Function keys

<b>Ctrl+F2</b>	Choose the print preview command (Microsoft office Button)
<b>Ctrl+F3</b>	Cut on the spike
<b>Ctrl+F4</b>	Close the window
<b>Ctrl+F6</b>	Go to the next window
<b>Ctrl+F9</b>	Insert an empty field
<b>Ctrl+F10</b>	Maximise the document window
<b>Ctrl+F11</b>	Lock a field
<b>Ctrl+F12</b>	Choose the Open command (Microsoft Office Button)

**Portrait and Landscape** options are available in **Orientation** category of Page Setup.

**Alignment** refers to the position of text between the margins.

**Auto complete** is a feature in word that automatically completes the spelling of days of the week and months of the year that have more than five letters in their names.

### Function Keys

<b>F1</b>	Get help or visit Microsoft office Online.
<b>F2</b>	Move text or graphic.
<b>F4</b>	Repeat the last action
<b>F5</b>	Choose the Go To command (Home tab).
<b>F6</b>	Go to the next pane or frame.
<b>F7</b>	Choose the spelling command (Review tab)
<b>F8</b>	Extend a selection
<b>F9</b>	Update the selected fields
<b>F10</b>	Show key tips
<b>F11</b>	Go to the next field
<b>F12</b>	Choose the Save As command (Microsoft Office Button).

**Header and Footer** option is used to display information such as title and page number of the document.

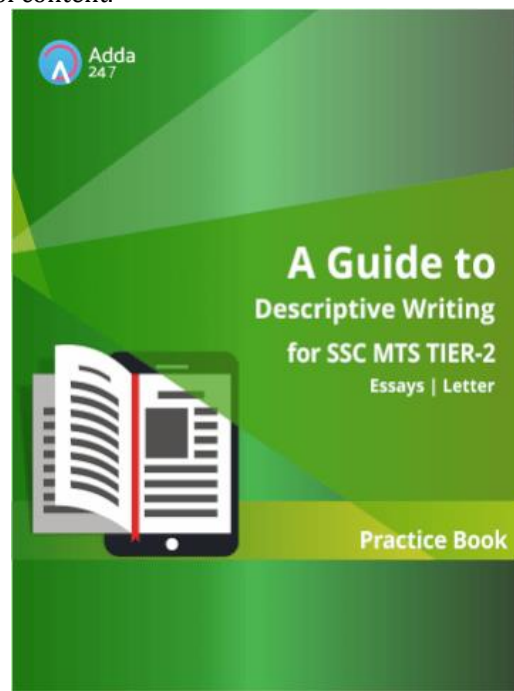
The bar at the top of the window that bears the name of the window, is known as **Title Bar**.

A screen element of MS Word that is usually located below the title bar that provides categorized options is called **Menu Bar**.

**Auto Correct** in word automatically corrects certain spelling, typing, capitalisation or grammar errors.

**Thesaurus** is used for finding a synonym for a word in the document.

Word has extensive lists of **bullets and numbering** features used for tables, lists, pages, chapters, headers, footnotes, and tables of content.



### MS EXCEL

**Microsoft Excel** is a spreadsheet application developed by Microsoft for Microsoft Windows and Mac OS.

It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications.

The intersection of a row and column is called a **Cell**.

The cell in which we are currently working is known as **Active Cell**.

Microsoft Excel's native file formats are denoted either by a .xls or .xlsx file extension.

A Worksheet is made of columns and rows, wherein columns run **Vertically** and rows run **Horizontally**.

Up to Excel 2003, the standard amount of columns has been 256 and 65,536 rows.

Excel 2007 onwards, the maximum number of rows per worksheet increased to 1,048,576 and the number of columns increased to 16,384.

Microsoft Excel has the basic features of all spreadsheets, using a grid of cells arranged in numbered rows and letter-named columns to organize data manipulations like arithmetic operations

The letter and number of the intersecting column and row is the **Cell Address**.

Short cut key to insert a new worksheet in MS-Excel is **ALT + Shift + F1** or **F11**.

**Sheet tab** is the tab at the bottom of the worksheet window that displays the name of the worksheet.

A Microsoft office document that contains one or more worksheets is known as a **Workbook**.

### Shortcut Keys of MS-Excel

Key	Description
<b>F2</b>	Edit the selected cell
<b>F5</b>	Go to a specific cell
<b>F7</b>	Spell check selected text and/or document
<b>F11</b>	Create chart
<b>Ctrl + Shift + ;</b>	Enter the current time
<b>Ctrl + ;</b>	Enter the current date
<b>Shift + F3</b>	Open the Excel insert function window
<b>Shift + F5</b>	Bring up Find and Replace box.
<b>Ctrl + A</b>	Select all contents of the worksheet
<b>Ctrl + B</b>	Bold highlighted selection
<b>Ctrl + I</b>	Italic highlighted selection
<b>Ctrl + U</b>	Underline highlighted selection
<b>Ctrl + P</b>	Bring up the print dialog box to begin

	printing
<b>Ctrl + Z</b>	Undo last action
<b>Ctrl + F9</b>	Minimise current workbook
<b>Ctrl + F10</b>	Maximise currently selected workbook
<b>Ctrl + F6</b>	Switch between open workbooks/window
<b>Ctrl + page up</b>	Move between Excel worksheet in the same Excel document.
<b>Ctrl + Page Down</b>	Move between Excel worksheets in the same Excel document

<b>Ctrl + Tab</b>	Move between two or more open Excel files
<b>Alt + =</b>	Create a formula to sum all of the above cells
<b>Ctrl + '</b>	Insert the value of the above cell into cell currently selected.
<b>Ctrl + Arrow key</b>	Move to next section to text
<b>Ctrl + Space</b>	Select entire column
<b>Shift + Space</b>	Select entire row

## POWER POINT

- **Microsoft PowerPoint** is a slide show presentation program developed by Microsoft. It was officially launched on May 22, 1990, as a part of the Microsoft Office suite.
- Filename extension: .ppt, .pptx, .pps or .ppsx

### Ribbon

The Ribbon is the strip of buttons across the top of the main window. The Ribbon has tabs which in turn contain groups of buttons for various options - some groups also contain galleries (for example galleries for Themes and Theme Colors.)

### Slides/Outline Pane

Normally placed on the left side of the interface, this pane contains two tables - the Slides tab and Outline tab.

### Status Bar

A horizontal strip at bottom; that provides information about the open presentation like slide number, applied Theme, etc. It also includes the view and zoom options.

### View Buttons

Essentially there are three view buttons displayed right beneath on the status bar with zoom-in and zoom-out.

- **Normal view** - Clicking this enables Normal view, Shift-clicking this gets you to Slide Master view.
- **Slide Sorter view** - Clicking this displays zoom-able thumbnails of every slide in the open presentation Shift-clicking this button gets you to Handout Master view.
- **Slide Show from current slide** - Show the presentation as a full screen slideshow from the current selected slide.

**Slide Area:** Displays the active slide

**Task Pane:** It contains more options and appears when you choose an option in one of the Ribbon tabs.

**ALL SHIFTS PAPERS OF 2016**

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### SHORTCUTS OF POWERPOINT

To do this	Press
Start the presentation from the beginning	F5
Perform the next animation for advance to the next slide	N, ENTER, PAGE DOWN, RIGHT, ARROW, DOWN ARROW, or SPACEBAR
Perform the previous animation or return to the previous slide	P, PAGE UP, LEFT ARROW, UP ARROW, or BACKSPACE
Go to slider number	number + ENTER
End a presentation	ESC or HYPHEN
Return to the first slide	1 + ENTER
Redisplay hidden pointer or change the pointer to a pen	CTRL + P
Redisplay hidden pointer or change the pointer to an arrow	CTRL + A
Go to the first or next hyperlink on a slide	TAB
Go to the last or previous hyperlink on a slide	SHIFT + TAB

## DATABASE MANAGEMENT SYSTEM

DBMS is the acronym of **Data Base Management System**. DBMS is a collection of interrelated data and a set of programs to access this data in a convenient and efficient way. It controls the organization, storage, retrieval, security and integrity of data in a database.

Types of Database Model: Network Database Model, Hierarchical Database model, Relational Database Model and Object-Oriented Database Model.

**Architecture of DBMS**-The generalized architecture of DBMS is called ANSI/ SPARC model. The architecture is divided into three levels:

- **External view or user view/View Level-** It is the highest level of data abstraction. This includes only those portions of database of concern to a user or Application program. Each user has a different external view and it is described by means of a scheme called external schema.
- **Conceptual view/Logical Level-** All the database entities and the relationship among them are included. One conceptual view represents the entire database called conceptual schema.
- **Internal view/Physical Level-** It is the lowest level of abstraction, closest to the physical storage method. It describes how the data is stored, what is the structure of data storage and the method of accessing these data. It is represented by internal schema.

**Data model:** A data model is a plan for building a database. The model represents data conceptually, the way the user sees it, rather than how computers store it. Data models focus on required data elements and associations.

- Entity – Relationship Model
- Relational Model

**Entity:** A thing (animate or inanimate) of independent physical or conceptual existence and distinguishable. In the University database context, an individual student, faculty member, a class room, are entities.

**Attributes:** Each entity is described by a set of attributes/properties.

**SQL (Structured Query Language)** is a database computer language designed for the retrieval and management of data in relational database.

**Constraints:** In SQL, we have the following constraints-  
**NOT NULL** - Indicates that a column cannot store NULL value  
**UNIQUE** - Ensures that each row for a column must have a unique value  
**CHECK** - Ensures that the value in a column meets a specific condition  
**DEFAULT** - Specifies a default value for a column

**Primary Key** uniquely identifies a record in a table.

A **candidate key** is a single field or the least combination of fields that uniquely identifies each record in the table.

A **foreign key** is generally a primary key from one table that appears as a field in another.

**DDL:** Data Definition Language is used for specifying the database schema. It contains commands to create tables, alter the structure, delete tables or rename tables. E.g. Create

**DML:** Data Manipulation Language is used for accessing and manipulating data in a database. E.g. Select, Update

**DCL:** Data Control Language is used for granting and revoking user access on a database.



**भारतीय डाक**



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## FULL FORMS & ABBREVIATIONS

TCP	Transmission Control Protocol	Tel Net	Telecommunication Networking
FTP	File Transfer Protocol	POP3	Post Office Protocol Version3
TFTP	Trivial File Transfer Protocol	BGP	Border Gateway Protocol
SFTP	Secure File Transfer Protocol	P2P	Point to Point Protocol
SMTP	Simple Mail Transfer Protocol	PPP	Peer to Peer Protocol
HTTP	Hyper Text Transfer Protocol	IP	Internet Protocol
HTTPS	Hyper Text Transfer Protocol Secure	SNMP	Simple Network Management Protocol
UDP	User Datagram Protocol	NTP	Network Time Protocol
ARP	Address Resolution Protocol	SIP	Session Initiation Protocol



DHCP	Dynamic Host Configuration Protocol	WIFI	Wireless fidelity
IMAP4	Internet Message Access Protocol Version 4	WIMAX	Worldwide Interoperability for Microwave Access
RARP	Reverse Address Resolution Protocol	ADSL	Asymmetric Digital Subscriber Line
SSH	Secure Shell	API	Application Program Interface
MIME	Multipurpose Internet Mail Extension	ARP	Address Resolution Protocol
SMIME	Secure MIME	RARP	Reverse ARP
ALGOL	Algorithmic Language	ICANN	Internet Corporation of Assign Names & Numbers
ANSI	American National Standard Institute	DPI	Dots Per Inch
ATM	Asynchronous Transfer Mode	DSL	Digital Subscriber Line
AS	Autonomous System	FAT	File Allocation Table
BASIC	Beginners All Purpose Symbolic Instruction Code	MANET	Mobile Ad-Hoc Network
BIOS	Basic input Output System	MIPS	Million Instruction Per Second
BPS	bit Per Second	BIPS	Billion Instruction Per Second
DNS	Domain Name Server	TIPS	Trillion Instruction Per Second
EDI	Electronic Data Interchange	NAT	Network Address Translation
URL	Uniform Resource Locator	IEEE	Institute of Electrical and Electronic Engineer
GIF	Graphics Interchange Format	IMAP	Internet Message Access Protocol
ASCII	American Standard Code for Information Interchange	ISDN	Integrated Servers Digital Network
ASP	Active Server Pages	ISO	International Standard Organization/ International Org for Standardization
BCC	Blind Carbon Copy	DHTML	Dynamic Hyper Text Markup Language
CC	Carbon copy	MAC	Media Access Control
CAD	Computer Aided Design	CAN	Campus Area Network
CDMA	Code Division Multiple Access	PAN	Personal Area Network
GSM	Global System for Mobile Communication	SAN	Storage Area Network
CMOS	Complementary Metal Oxide Semi-Conductor	CNM	Circulatory Network Mode
CMYK	Cyan Magenta Yellow Block	IPV4	Internet Protocol Version 4
GPS	Global Positioning System	IPV6	Internet Protocol Version 6
GUI	Graphical User Interface	DBMS	Data Base Management System
HDMI	High Definition Multimedia Interface	MODEM	Modulator Demodulator
GIGO	Garbage in Garbage Out	RAM	Random Access Memory
LIFO	Last In First Out	ROM	Read Only Memory
FIFO	First In First Out	SMPS	Switch Mode Power Supply
PING	Packet Internet Gopher	OMR	Optical Mark Reader / Recognition
HDD	Hard Disc Drive	OCR	Optical Character Reader / Recognition
NIC	Network Interface Controller/Cord	BCR	Bar Code Reader
HDTV	High Definition Television	MICR	Magnetic Ink Character Reader / Recognition
ISP	Internet Service Provider	PCB	Printer Circuit Board
JPEG	Joint Picture Expert Group	SRAM	Static RAM
LCD	Liquid Crystal Display	DRAM	Dynamic RAM
LED	Light Emitting Diode	PROM	Programmable ROM
TFT	Thin Film Transistor	EPROM	Electrically PROM
CRT	Cathode Ray Tube	EEPROM	Electrically Erasable PROM
MIDI	Musical Instrument Digital Interface	HDD	Hard Disc Drive
MPEG	Moving Picture Expert Group	FDD	Floppy Disc Drive
PDA	Personal Digital Assistants	CD	Compact Disc
PDF	Portable Document Format	DVD	Digital Video/Versatile Disc
ARPANET	Advanced Research Projects Agency Network	BRD	Blu Ray Disc
SQL	Structured Query Language	HVD	Holographic Versatile Disc
USB	Universal Serial Bus	ACID	Atomicity Consistency Isolation Durability
VIRUS	Vital Information Resource Under Siege	WYSIWYG	What you see is what you get
VOIP	Voice Over Internet Protocol		
IVR	Interactive Voice Response		

## GLOSSARY

### A

- **Access time** - The amount of time it takes for requested information to be delivered from disks and memory.
- **Antivirus software** - A program designed to look for and destroy viruses that may infect the memory of a computer or files stored on a computer.
- **Artificial intelligence (AI)** - Computer systems that attempt to imitate human processes for analyzing and solving problems.
- **Accumulator** - A local storage area called a Register, in which the result of an arithmetic or logic operation is formed.

### B

- **BIT** - It is basic unit of computers. It has two values 1 & 0 only.
- **BYTE** - Combination of 8 Bits.
- **Basic Input Output System (BIOS)** - Also known as ROM BIOS. It provides an abstraction layer for the hardware, i.e., a consistent way for application programs and operating system to interact with input/output devices.
- **Bug** - A software bug is an error, flaw, failure, or fault in a computer program or system produces an incorrect or unexpected result.
- **Bus** - A pathway along which electronic signals travel between the components of a computer system.

### C

- **Cookie** - A packet of information that travels between a browser and the web server.
- **Crash** - Your computer or application no longer works correctly and so you "lose" all the work you've done since the last time you saved.
- **Command** - An instruction that causes a program or computer to perform a function.
- **Cache** - It is a memory storage area that keeps frequent use data readily available to the computer so that the computer does not retrieve them from slow storage devices.
- **Clock Speed** - The speed of computer is measured in clock speed. High clock speed is synonymous with high processing capability. It is measured in Megahertz (MHz).
- **Column** - A vertical block of cells in a table or spreadsheet.

### D

- **Delete** - To remove an item of data from a file or to remove a file from the disk.
- **Debugging** - Locating and eliminating defects in a program.
- **Desktop** - The electronic work area on a display screen.
- **Dots Per Inch (DPI)** - It is defined as the measure of the resolution of a printer and scanner, or monitor.
- **Domain Name** - A unique name that identifies a particular website and represents the name of the server where the web pages reside.

### E

- **Edit** - To make certain changes in existing data.

- **Ethernet Card** - A network adapter that enables a computer to connect to an Ethernet.

### F

- **Fax** - A shortened form of the word facsimile. A copy of a document transmitted electronically from one machine to another.
- **File transfer protocol (FTP)** - A set of guidelines or standards that establish the format in which files can be transmitted from one computer to another.
- **Firewall** - A security system usually consisting of hardware and software that prevents unauthorized persons from accessing certain parts of a program, database, or network.
- **Flash Memory** - It is a type of non-volatile computer storage chip that can be electrically erased and reprogrammed. It was developed by EEPROM.

### G

- **Gateway** - A machine that links two networks using different protocols.
- **Gigabyte** - A measurement of the storage capacity of a device. One gigabyte represents 1024 megabytes.
- **Google** - search engine on the web.
- **Gopher** - A protocol used for locating and transferring information on the internet. It is an internet search tool that allows users to access textual information.
- **GUI** - Graphical User Interface uses icons and menus to carry out commands such as opening files, delete files, move files etc..
- **Graphic Interchange Format (GIF)** - A simple file format for pictures and photographs that are compressed so that they can be sent quickly.

### H

- **Hard copy** - Text or graphics printed on paper; also called a printout.
- **Hard disk** - A rigid type of magnetic medium that can store large amounts of information.
- **Hyperlink** - An image or portion of text on a webpage which is linked to another webpage.
- **Hub** - A network device that connects multiple computers on a LAN so that they can communicate with another network and the internet.
- **Header** - Repetitive information that appears at the top (the head) of every page of a document.
- **Hypertext transfer protocol (HTTP)** - The protocol used on the World Wide Web that permits Web clients (Web browsers) to communicate with Web servers

### I

- **Icons** - In a graphical user interface (GUI), a small, pictorial, on screen representation of an object, such as a document, program, folder or disk drive.
- **Instant messaging (IM)** - A chat program that lets people communicate over the Internet in real time.
- **Internet protocol (IP) address** - A unique set of numbers that identifies a computer over a network.
- **Internet service provider (ISP)** - An organization that provides access to the Internet for a fee.

- **Intranet** - A private network established by an organization for the exclusive use of its employees. Firewalls prevent outsiders from gaining access to an organization's intranet

## J

- **JPEG** - Joint Photographic Experts Group. A format for storing complex graphics in compressed form.
- **Justification** - Aligning lines of text at the left margin, the right margin, both margins, and the centre. Text aligned at both margins is considered fully justified.

## K

- **Keyboard** - The device used to enter information into a computer.
- **Kilobyte** - A measurement of the storage capacity of a device. One kilobyte represents 1024 bytes.

## L

- **LAN** - A local area network (LAN) is a computer network that interconnects computers within a limited area such as a home, school, computer laboratory, or office building, using network media.
- **Laptop computer** - A portable computer. Also known as a notebook computer.
- **Landscape Orientation** - The positioning of the page so that the information is printed across the long dimension of the page.
- **Liveware** - It is a term to describe the human system, opposed to hardware or software in a computer.

## M

- **Macro virus** - A type of virus that attaches itself to documents or word processing templates.
- **Malware** - Software that disrupts normal computer functions or sends a user's personal data without the user's authorization.
- **Memory** - The part of a computer that stores information.
- **Memory Cell** - A circuit in memory that represents a single bit of information.
- **Mass Storage** - Storage systems that provide access to hundreds of billions of bytes of stored data. They are often referred to as Archival Storage because of the very large volumes of historical or backup data they can store.
- **MIPS** - An acronym derived from millions of instructions per second. Used to measure the speed of a processor.
- **Morphing** - The transformation of one image into another image.
- **Mobile Commerce (m-Commerce)** - A form of e-commerce that has the ability to conduct monetary transactions via a mobile device such as a cell phone.
- **Mozilla** - a web browser and successor to Netscape Communicator.
- **Multitasking** - The ability of a computer to execute more than one program at a time.

## N

- **NIBBLE** - Combination of four bits.
- **Network** - A system of interconnected computers. They are of three types i. e. LAN, MAN, WAN.

- **Network Interface Card (NIC)** - This is a part of the computer that allows it to talk to other computers via a network protocol like TCP/IP.

- **Node** - A computer which is attached to the network. Each node has its own address on the network so that it can be uniquely identified and can communicate with other nodes on the same or different network.

## O

- **Offline** - Refers to the state in which a computer is temporarily or permanently unable to communicate with another computer.
- **Online** - Refers to the state in which a computer is ready to communicate with other computers.
- **Open source software** - Software that makes the underlying source code available to all users at no charge.
- **Operating system (OS)** - Software that manages the internal functions and controls the operations of a computer.

## P

- **Palmtop computer** - A portable computer smaller than a notebook (or laptop) computer that fits on the palm of your hand. Also called a handheld computer.
- **Password** - A user's secret identification code, required to access stored material. A procedure intended to prevent information from being accessed by unauthorized persons.
- **Piracy** - The illegal copying of software or other creative works.
- **Peripherals** - A connectable device that has an auxiliary function outside the permanent system configuration such as plotters, printers and graphic displays.
- **Phishing** - A type of computer fraud that tries to trick users into revealing their passwords and other confidential information.
- **Pixel** - A smallest picture element of a digital image. The smaller the pixels, the higher the resolution.
- **Port** - An electrical connection on the computer into which a cable can be plugged so that the computer can communicate with other devices such as printer or modem.
- **Protocol** - A set of rules and regulations that coordinates the exchange of information over the network.
- **Portrait orientation** - Positioning paper so that information is printed across the short dimension of the paper.

## Q

- **Query** - An alternate pipe form of operating system, which handles data in the form of messages rather than bytes.
- **Qwerty** - It is one of the standard computer keyboard, with the character Q, W, E, R, T, Y on the top row of letters on the keyboard.

## R

- **Response time** - The time a computer takes to execute a command.

- **Retrieve** - To call up information from memory or storage so that it can be processed in some way.
- **Record** - A collection of all the information pertaining to a particular subject.
- **Row** - A horizontal block of cells in a table or spreadsheet.
- **Resolution** - Measurement of the degree of sharpness of a displayed image. It is defined as number of pixels per square inch on a computer generated display.
- **Register** - A temporary storage unit for quick, direct accessibility of a small amount of data for processing.

#### S

- **Save As** - Give the file a name and/or store the file in a certain place.
- **Save** - Tell the computer to create a file on disk that has the information you've put into the document.
- **Scroll bar** - Allows you to move around through your document.
- **Shut down** - To quit all applications and turn off the computer.
- **Spam** - unwanted repetitious messages, such as unsolicited bulk e-mail.
- **Scanner** - An input device that can copy a printed page into a computer's memory, thus doing away with the need to type the copy.
- **Screen saver** - A program that changes the screen display while the user is away from the computer.
- **Server** - A computer that manages a shared resource and provides a set of shared user services to the clients.
- **Search Engine** - Software that searches, gathers and identifies information from a database based on an index, keywords or titles.
- **Spam** - Unwanted repetitious messages, such as unsolicited bulk e-mail.
- **Soft copy** - Information shown on the display screen.
- **Sort** - To arrange fields, records, or files in a predetermined sequence.
- **Surfing the Net** - Browsing through various Web sites on the Internet in search of interesting things.

#### T

- **Trash** - Place where you put files and folders that you want to delete or get rid of.
- **Topology** - The structure of the network, including physical connections such as wiring schemes and logical interactions between network devices.
- **Track** - A ring on a disk where data can be written.

- **Telnet** - A protocol for remote computing on the internet that allows a computer to act as a remote terminal on another machine, anywhere on the internet.
- **Touchpad** - The device on a laptop computer that takes the place of a mouse.
- **Touch screen technology** - The technology that permits a user to perform a function simply by touching the screen on an appropriate spot.

#### U

- **Uninterrupted Power Supply (UPS)** - A Battery powered backup system that provides enough electricity to a computer during a power outage so that a user can save files before shutting down the computer.
- **Universal Serial Bus (USB)** - A common standard for connecting multiple peripherals to a computer as needed.
- **Upload** - To transfer information from a client computer to a host computer.

#### V

- **Virus** - A piece of computer code designed as a prank or malicious act to spread from one computer to another by attaching itself to other programs.

#### W

- **WAP** - Wireless Application Protocol is a specification for a set of communication protocol used to allow wireless devices to access the internet and other utilities.
- **Web browser** - Software that permits a user with a click of a mouse to locate, display, and download text, video, audio, and graphics stored in a host computer on the Web.  
The most common Web browsers now in use are Internet Explorer, Google Chrome and Mozilla Firefox.
- **Web site** - One or more related pages created by an individual or an organization and posted on the World Wide Web.
- **Wi-Fi (Wireless fidelity)** - A process that permits high-speed wireless transmission of data.
- **Word processing** - The electronic process of creating, formatting, editing, proofreading, and printing documents.
- **Workstation** - A desktop computer that runs applications and serves as an access point in a local area network.

#### Z

- **Zombie** - A computer that has been hijacked by a cracker without the owner's knowledge and used to perform malicious tasks on the Internet.

### Important Questions Based on Microsoft Office:


1. **Microsoft Office is a \_\_\_\_\_.**  
A) Shareware                      B) Public-domain software  
C) Open source software       D) An application suit  
E) Firmware
2. **Which term is not related with font?**  
A) Font face                      B) Font size                      C) Font color  
D) Font grammar                E) None of these
3. **The valid format of MS Word is \_\_\_\_\_.**  
A) .jpeg                              B) .png                              C) .doc  
D) .exe                                E) None of these
4. **Which of the following option may be used to change page-size and margins?**  
A) Page Layout                      B) View                              C) Tools  
D) Data                                E) None of these



5. To justify the selected text, the shortcut key is \_\_\_\_\_.  
A) Ctrl + 1      B) Ctrl + J      C) Ctrl + U  
D) Ctrl + Alt + K      E) None of these
6. Workbook is a collection of \_\_\_\_\_ in MS Excel?  
A) page set-up      B) buttons      C) diagrams  
D) charts      E) worksheets
7. In order to move from one worksheet to another in MS-Excel workbook. One should click \_\_\_\_\_.  
A) active cell      B) scroll bar      C) sheet tab  
D) tab button      E) None of these
8. In a spreadsheet, a \_\_\_\_\_ is a number you will use in a calculation.  
A) label      B) cell      C) field  
D) value      E) None of these
9. In Power Point, which of the following will not advance the slides in a slide show view?  
A) Esc key      B) The spacebar  
C) The Enter key      D) The mouse button  
E) None of these
10. In Microsoft PowerPoint, two kinds of sound effects files that can be added to the presentation are  
A) .wav files and .mid files  
B) wav files and .gif files      C) wav files and .jpg files  
D) jpg files and .gif files      E) None of these
11. Which PowerPoint view displays each slide of the presentation as a thumbnail and is useful for rearranging slides?  
A) Slide Sorter      B) Slide Show      C) Slide Master  
D) Notes Page      E) Slide Design
12. If you want to insert a chart to your slide then go to \_\_\_\_\_.  
A) Insert - Chart      B) Home - Chart      C) Format - Chart  
D) Table - Chart      E) None of these
13. Which of the following is not a type of Microsoft access database object?  
A) Table      B) Worksheets      C) Modules  
D) Macros      E) None of these
14. Row in an Access table is also known as \_\_\_\_\_.  
A) field      B) record      C) data  
D) type      E) None of these
15. Queries in Access can be used as \_\_\_\_\_.  
A) View, change and analyse data in different ways  
B) A source of records for forms and reports  
C) to access internet      D) Both a and b  
E) None of these
16. Pressing F8 key for three times selects  
A) A word      B) A sentence      C) A paragraph  
D) Entire document      E) None of these
17. What happens if you press Ctrl + Shift + F8?  
A) It activates extended selection  
B) It activates the rectangular selection  
C) It selects the paragraph on which the insertion line is.  
D) Both (A) and (C)      E) None of these
18. How can you disable extended selection mode?  
A) Press F8 again to disable  
B) Press Del to disable      C) Press Esc to disable  
D) Press Enter to disable      E) It cannot be disabled
19. What does EXT indicator on status bar of MS Word indicate?  
A) It indicates whether the external text is pasted on document or not  
B) It indicates whether extended add-ons are installed on MS Word or not  
C) It indicates whether Extended Selection mode is turned on or off  
D) Both (A) and (B)      E) None of these
20. What is the maximum number of lines you can set for a drop cap?  
A) 3      B) 10      C) 15  
D) 20      E) 50
21. What is the default number of lines to drop for drop cap?  
A) 3      B) 10      C) 15  
D) 20      E) 7
22. What is the shortcut key you can press to create a copyright symbol?  
A) Alt+Ctrl+C      B) Alt + C      C) Ctrl + C  
D) Ctrl + Shift + C      E) None of these
23. How many columns can you insert in a word document in maximum?  
A) 35      B) 63      C) 55  
D) 65      E) 60
24. What is the smallest and largest font size available in Font Size tool on formatting toolbar?  
A) 8 and 72      B) 8 and 64      C) 12 and 72  
D) 10 and 40      E) None of these
25. Select all the text in MS Word document by:  
A) Ctrl + S      B) Ctrl + 1      C) Shift + A  
D) Ctrl + A      E) None of these
26. MS Word is \_\_\_\_\_ software.  
A) System      B) Application      C) Programming  
D) Compiler      E) None of these
27. The shortcut key for paste selected text/picture in MS Word is \_\_\_\_\_.  
A) Ctrl + X      B) Ctrl + C      C) Ctrl + V  
D) Ctrl + Z      E) None of these
28. Using Print Preview is useful. When you want to  
A) colour the document      B) save the document  
C) delete the document      D) copy the document  
E) view how the document will appear when printed
29. To indent the first paragraph of your report, you should use this key.  
A) Space bar      B) Return key      C) Tab key  
D) Shift key      E) None of these
30. In Excel, the contents of the active cell are displayed in the \_\_\_\_\_.  
A) footer bar      B) tool bar      C) task bar  
D) menu bar      E) formula bar
31. \_\_\_\_\_ appear at the bottom of the Excel Window.  
A) Work sheet tabs      B) Name box      C) Formula bar  
D) Title bar      E) None of these
32. In MS excel \_\_\_\_\_ are numbered from 1 to onwards and \_\_\_\_\_ are numbered from A to onwards.  
A) Columns, rows      B) Rows, slides      C) Slides, rows  
D) Rows, columns      E) None of these
33. What is the default column width of MS Excel?

- A) 5.5 B) 2.98 C) 8.43  
D) 6.49 E) None of these
34. To insert a new slide go to \_\_\_\_\_ tab, in the Slides group, click New Slide.  
A) Home B) View C) Animations  
D) Slide show E) None of these
35. Times new Roman, Cambria, Arial are the example of \_\_\_\_\_.  
A) Font face B) Themes C) SmartArt  
D) Clipart E) None of these
36. In Access a \_\_\_\_\_ is the collection of data items of all the fields pertaining to one entity.  
A) field B) record C) form  
D) report E) None of these
37. A table of how many columns can you insert in a word document in maximum.  
A) 55 B) 42 C) 32  
D) 63 E) As you wish
38. In MS Access a \_\_\_\_\_ name must be unique within a database.  
A) Field B) Record C) Table  
D) Character E) None of these
39. The minimum number of rows and columns in MS Word document is  
A) 1 and 1 B) 2 and 1 C) 2 and 2  
D) 3 and 3 E) None of these
40. Thesaurus tool in MS Word is used for  
A) Spelling suggestions B) Grammar options  
C) Synonyms and Antonyms words  
D) All of the above E) None of these
41. Why Drop Caps are used in document?  
A) To drop all the capital letters  
B) To automatically begin each paragraph with capital letter  
C) To begin a paragraph with a large dropped initial capital letter  
D) To drop the numbers  
E) None of these
42. A bookmark is an item or location in document that you identify as a name for future reference. Which of the following task is accomplished by using bookmarks?  
A) To add anchors in web page  
B) To mark the ending of a paragraph of document  
C) To quickly jump to specific location in document  
D) To add hyperlinks in webpage  
E) None of these
43. A word processor would most likely be used to do  
A) Keep an account of money spent  
B) Do a computer search in media center  
C) Maintain an inventory  
D) Type a biography  
E) Maintain records of database
44. Which of the following is not valid version of MS Office?  
A) Office XP B) Office Vista C) Office 2007  
D) Office 2010 E) None of these
45. You cannot close MS Word application by  
A) Choosing File menu then Exit submenu

- B) Press Alt+F4  
C) Click X button on title bar  
D) From File menu choose Close submenu  
E) None of these
46. The key F12 in MS Word opens a  
A) Save As dialog box B) Open dialog box  
C) Save dialog box D) Close dialog box  
E) Opens help menu
47. What is the short cut key to open the Open dialog box?  
A) F12 B) Shift F12 C) Alt + F1  
D) Ctrl + F12 E) None of these
48. Which of the following symbol sets would be most likely to contain a mathematical symbol such as a degree sign, greater than or equal to, or a Greek letter?  
A) Wingdings B) Wingdings 3 C) Webdings  
D) Symbol E) Arial



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47. When assigning a shortcut key to a symbol, you should always try to select a key or key combination that is:  
A) Unassigned  
B) Located on the ten-key pad section of your keyboard.  
C) Assigned to another task.  
D) From the same font family as the symbol.  
E) None of these
48. Suppose you wanted to create an AutoCorrect entry that would type the words 'We regret to inform you that your submission has been declined' of the following choices, which would be the best name you could assign to this entry?  
A) Regret B) Subdual  
C) We regret to inform you that your submission has been declined  
D) 11 E) None of these
49. If you want to convert a symbol or several lines of text into an AutoCorrect entry, you should:  
A) Insert the symbol or type the text in a Word document first. Then, select the text or symbol and go to the AutoCorrect dialog box.  
B) Click the Tools menu and choose AutoCorrect Options. Then, click the Insert menu and choose Symbol

(or click the Format menu and choose Paragraph) to add the symbol or paragraph to AutoCorrect.

C) AutoCorrect can only accommodate one line of text. It is not possible to convert a symbol or multiple lines of text into an AutoCorrect entry.

D) Insert the symbol or type the text in a Word document first. Then, select the text or symbol and click the Edit menu followed by Paste Special. Select New AutoCorrect Entry and then click OK.

E) None of the above

50. AutoCorrect was originally designed to replace \_\_\_\_\_ words as you type.

A) Short, repetitive B) Grammatically incorrect

C) Misspelled words D) Incorrect Image

E) None of the above

51. Which of the following is the second step in creating a macro?

A) Start recording

B) Using your mouse or keyboard, perform the task you want to automate

C) Assign a keyboard shortcut to the macro

D) Give the macro a name

E) None of these

52. If you will be displaying or printing your document on another computer, you'll want to make sure and select the \_\_\_\_\_ option under the 'Save' tab.

A) Embed Fonts B) Embed True Type Fonts

C) Save True Type Fonts D) Save Fonts

E) Font Face

53. In Word, the mailing list is known as the \_\_\_\_\_.

A) Data sheet B) Source C) Data source

D) Sheet E) Hyperlink

54. To delete 3-D rotation from the shape, point to 3-D Rotation, and then click \_\_\_\_.

A) Non Rotation B) Not Rotation C) None Rotation

D) No Rotation E) None of these

55. In Microsoft Office Power-Point 2007, a \_\_\_\_ is a connection from one slide to another slide in the same presentation or to a slide in another presentation, an e-mail address, a Web page, or a file.

A) Hyphenation B) Header C) Footer

D) Hyperlink E) None of these

56. In PowerPoint, which of the following is the default page setup orientation for notes pages, outlines and handouts?

A) Vertical

B) Landscape C) Portrait

D) All of these

E) None of these

57. In slide layout panel, how many layouts are available for next layout by default?

A) 4

B) 7

C) 12

D) 15

E) None of these

58. In Access, this operation copies a backup file from the storage medium back onto the computer :

A) Restore

B) Recreate

C) Copy

D) Structure

E) None of these

59. In the Form Wizard dialog box, the fields from the selected table are displayed in which list box?

A) All fields

B) All Records

C) Available Records D) Available Fields

E) None of these

60. Which control does access use to link data access page components to access data?

A) Microsoft Office Data Source Control

B) Microsoft Dynamic Data Control

C) Microsoft Data Connection Control

D) Microsoft Default Connection Control

E) None of the above



## Miscellaneous Questions on Computer Aptitude

1. Pokémon Go app, an immensely popular game which allowed people to wander around their hometowns and score points by interacting with characters, within the confines of a game, then going to real-life places to make progress in virtual environments. Which of the following is related technology?

(a) Artificial Intelligence

(b) Virtual Reality

(c) Augmented Reality

(d) Sleeker

(e) None of these

*Sol. Augmented reality is a technology that superimposes a computer-generated image on a user's view of the real world.*

2. Which type of system can learn and adjust to new circumstances by themselves?

(a) Database management system

(b) Expert systems

(c) Geographical systems

(d) Neural networks

(e) File based systems

**Sol.** Neural networks can learn and adjust to new circumstances by themselves.

3. In 2014, Apple decided to invent a programming language. What is the name of that programming language?

(a) Cyanogen  
(b) Ruby  
(c) Swift  
(d) Oxygen  
(e) None of these

**Sol.** Swift is a general-purpose, multi-paradigm, compiled programming language developed by Apple Inc.

4. Which among the following is the appropriate term to find specific information on a website?

(a) Analytical research  
(b) Drill down  
(c) MDX querying  
(d) Checking its Homepage.  
(e) Scroll down

**Sol.** In information technology to drill down means to move from one place to another, information to detailed data by focusing in on something.

5. Verizon Communications on July 2016, announced plans to acquire Yahoo for \$4.8 billion in cash. Yahoo (www.yahoo.com) is a \_\_\_\_\_.

(a) Website for Consumers  
(b) Web Portal  
(c) Organization that allocates web addresses  
(d) E-mail service  
(e) E-commerce website

**Sol.** A Web portal is a specially designed website that often serves as the single point of access for information.

The first Web portals were online services, such as AOL, that provided access to the Web, but by now most of the traditional search engines have transformed themselves into Web portals to attract and keep a larger audience.

6. A \_\_\_\_\_'s main purpose is to prohibit unauthorized access to your computer via the Internet.

(a) Popup blocker  
(b) Firewall  
(c) Spyware blocker  
(d) Spam assassin  
(e) Restore file

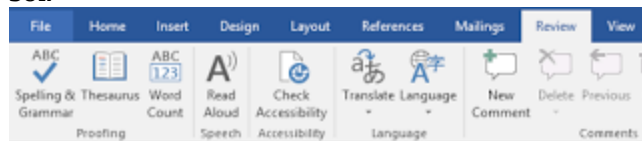
**Sol.** A firewall acts as a barrier between a trusted network and an untrusted network. A firewall controls access to the resources of a network through a positive control model. This means that the only traffic allowed onto the network is defined in the firewall policy; all other traffic is denied.

Firewalls can be implemented in both hardware and software, or a combination of both.

7. Word is a word processor developed by Microsoft. In MS Word spelling check is a feature available in which tab?

(a) Page Layout  
(b) Home  
(c) Insert  
(d) Review  
(e) References

**Sol.**



8. \_\_\_\_\_ is the automatic addition of names and addresses from a database to letters and envelopes in order to facilitate sending mail especially advertising, to many addresses.

(a) mail merge  
(b) bcc  
(c) cc  
(d) balloons  
(e) New

**Sol.** Mail merge is used to create multiple documents at once. These documents have identical layout, formatting, text, and graphics. Only specific sections of each document vary and are personalised.

9. =Sum (S3 : S10) is an example of a

(a) function  
(b) formula  
(c) cell address  
(d) value  
(e) None of these

**Sol.** It is a formula to get sum of the data from cell number S3 to S10.

10. The first electronic digital computer contained \_\_\_\_\_?

(a) Electronic valves  
(b) Neural Networks  
(c) Fuzzy Logic  
(d) Semiconductor memory  
(e) None of these

**Sol.** The first electronic digital computer contained electronic valves.

11. What is the blinking symbol on the screen that shows where the next character will appear?

(a) Cursor  
(b) Delete key  
(c) Arrow key  
(d) Return key  
(e) None of these

**Sol.** In computer user interfaces, a cursor is an indicator used to show the current position for user interaction on a computer monitor or other display device that will respond to input from a text input or pointing device.



12. The dual-port version of DRAM formerly used in graphics adaptors is :

- (a) FPM DRAM
- (b) EDORAM
- (c) VRAM
- (d) DDRSDRAM
- (e) None of these

**Sol.** Video RAM, or VRAM, is a dual-ported variant of dynamic RAM (DRAM), which was once commonly used to store the frame buffer in some graphics adapters.

13. Which of the following is a term related with printer?

- (a) DVD
- (b) Cartridge
- (c) Hard-disk
- (d) Keyboard
- (e) None of these

**Sol.** An ink cartridge or inkjet cartridge is a component of an inkjet printer that contains the ink that is deposited onto paper during printing.

14. To justify the selected text, the shortcut key is \_\_\_\_.

- (a) Ctrl+1
- (b) Ctrl+J
- (c) Ctrl+U
- (d) Ctrl+Alt+K
- (e) None of these

**Sol.** Ctrl+J is used to justify the selected text.

15. Trackball is an example of a/an \_\_\_\_.

- (a) Programming device
- (b) Pointing device
- (c) Output device
- (d) Software device
- (e) Printing device

**Sol.** Trackball is an example of a pointing device (mouse).

16. Which among the following is an appropriate binary conversion for the number 421 (which is of base 10)?

- (a) 10101010
- (b) 11010100
- (c) 10011001
- (d) 110100101
- (e) 010101010

**Sol.**

2	421	1
2	210	0
2	105	1
2	52	0
2	26	0
2	13	1
2	6	0
2	3	1
2	1	

Hence,  $(421)_{10} = (110100101)_2$

## PREVIOUS YEAR PAPERS 2011-2016



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17. If A and B are two input ends of AND logic gate and AB is the only output. What will be the output if the input is A=1 and B=0?

- (a) 1
- (b) 0
- (c) 101
- (d) 01
- (e) 10

**Sol.**

Following is the truth table of AND gate:

2 Input AND gate		
A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

18. If  $\Delta$  represents '1' and  $\circ$  represents '0'. What will be the one's complement of  $\circ\Delta\Delta\circ\Delta$ ?

- (a) 011001
- (b) 100110
- (c) 101010
- (d) 000000
- (e) 111111

**Sol.**  $\circ\Delta\Delta\circ\Delta$  represents 011001. For finding one's complement we change each 1 to 0 and each 0 to 1. Hence One's complement of 011001 will be 100110.

19. Which of the following is a correct set of hexadecimal digits?

- (a) 102n
- (b) a19fk
- (c) ZOLO12
- (d) FACE
- (e) 0101xx

**Sol.** hexadecimal digits are written using symbols from 0-9 or A-F

20. Which of the following is a Logical Conjunction?

- (a) AND gate

- (b) OR gate  
(c) NOT gate  
(d) both(a) and (b)  
(e) All of the above

**Sol.** When two statements are combined with an 'and,' then it is a conjunction. For conjunctions, both statements must be true for the compound (result) statement to be true. When your two statements are combined with an 'or,' it is a disjunction.

21. If  $\bar{N}$  represents '1' and  $N$  represents '0'. A and B are two input ends of OR logic gate and C is the only output. What will be the output if the input is  $A = \bar{N}$  and  $B = \bar{N}$ ?

- (a)  $\bar{N} \bar{N}$   
(b)  $\bar{N}$   
(c)  $\bar{N}$   
(d)  $\bar{N} \bar{N}$   
(e)  $\bar{N} \bar{N} \bar{N}$

**Sol.**

$N = 0$  and  $\bar{N} = 1$

Given that  $A = 1$  and  $B = 1$  Following the truth table for OR gate

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

This the output C will be 1, i.e.  $\bar{N}$  as  $\bar{N} = 1$

**Directions (22-23) :** Triangle represents  $\Delta$  (1) and circle represents  $\circ$  (0). If triangle appears in unit's place then its value is 1. If it appears in 10's place its value is doubled to 2 like that it continues. Using the given terminology answer the following questions. For example:

$\Delta = 1$   
 $\Delta \circ \Delta = 4, 0, 1 = 4 + 0 + 1$   
 $\Delta \circ = 2$

22. How will you represent '87' in this code language?

- (a)  $\circ \Delta \Delta \Delta \circ \Delta \Delta$   
(b)  $\Delta \circ \Delta \circ \Delta \Delta \Delta$   
(c)  $\Delta \Delta \circ \Delta \Delta \Delta \Delta$   
(d)  $\Delta \circ \circ \Delta \circ \circ \Delta$   
(e)  $\Delta \Delta \circ \Delta \Delta \Delta \circ$

**Sol.**

$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
64	32	16	8	4	2	1
1	0	1	0	1	1	1

$1010111 = \Delta \circ \Delta \circ \Delta \Delta \Delta$

23. What will be the code for  $\Delta \Delta \circ \circ \circ \Delta \circ$ ?

- (a) 98

- (b) 97  
(c) 90  
(d) 94  
(e) 99

**Sol.**

$1100010 = 64 + 32 + 2 + 98$

$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
64	32	16	8	4	2	1
1	1	0	0	0	1	0

24. What will be the code for one's complement of  $\Delta \Delta \circ \Delta$ ?

- (a) 2  
(b) 3  
(c) 4  
(d) 5  
(e) 6

**Sol.** 1's complement of  $1101 = 0010 = 2$

25. Frame relay operates in which of the following layers?

- (a) Physical and Data Link layers  
(b) Data link and Network Layers  
(c) Session Layer and Physical Layer  
(d) Network Layer and Session layer  
(e) Presentation Layer and Session Layer

**Sol.** Frame Relay is a high-performance WAN protocol that operates at the physical and data link layers of the OSI reference model. Frame Relay originally was designed for use across Integrated Services Digital Network (ISDN) interfaces.

26. How can we perform tasks on a computer without using the Windows graphical interface?

- (a) By using command prompt window  
(b) By using Office 360  
(c) By using control panel  
(d) By connecting through the internet  
(e) None of the above

**Sol.** By using command prompt tasks can be performed without graphical user interface.

27. What is the term used as basic transfer unit associated with a packet-switched network?

- (a) MAC  
(b) Datagram  
(c) Internet Protocol  
(d) Bits  
(e) None of the above

**Sol.** A datagram is a basic transfer unit associated with a packet-switched network. Datagrams are typically structured in header and payload sections. Datagrams provide a connectionless communication service across a packet-switched network.

28. GIGO is a simple principle followed by Computers. GIGO stands for?

- (a) Garbage In Garbage Out  
(b) Great Instructions Great Output  
(c) Good Input Good Output  
(d) Great Instructions Go Out  
(e) Gnome Instructions Global Output

**Sol.** The term "garbage in, garbage out" originated in the computer science and information technology fields to illustrate the fact that the quality of the output received from a computer program depends on the quality of the information that was input.

29. Given the following URL -  
`http://www.example.com:80/path/to/myfile.html`  
Here - 'www.example.com', ':80' and stand for \_\_\_\_ and \_\_\_\_ respectively.  
(a) IP and source  
(b) Domain Name and Port  
(c) File name and Path  
(d) Path and Port  
(e) IP and Locator

**Sol.** `www.example.com` is domain name and `:80` is the port number in the given URL.

30. Extensible Markup Language (XML) is a simple, very flexible text format derived from \_\_\_\_.  
(a) HTML  
(b) SGML  
(c) CSS  
(d) FTP  
(e) HTTP

**Sol.** The Standard Generalized Markup Language is a standard for defining generalized markup languages for documents.

31. \_\_\_\_ is software which has its source code freely available for use, viewing, modification, and redistribution.  
(a) Free Software  
(b) Operating System  
(c) Open Source  
(d) Application Software  
(e) System Software

**Sol.** Open source doesn't just mean access to the source code. The distribution terms of open-source software must facilitate free Redistribution; it must allow distribution in source code as well as compiled form; the license must allow modifications and derived works; the license must not restrict anyone from making use of the program.

32. Which among the following are Intelligent Personal Assistant by Google, Microsoft and Apple respectively?  
(a) Cortana, Google Now, Siri  
(b) Niki, Siri, Wizard  
(c) Teno, Wizard, Cortana  
(d) Google Now, Cortana, Siri  
(e) Cortana, Hazel, Siri

**Sol.** Siri is Apple's intelligent personal assistant and knowledge navigator allows users of its devices to send

messages, schedule meetings and make phone calls. Cortana is Microsoft's primary intelligent personal assistant, which was developed in time for the launch of the Windows Phone 8.1 operating system in 2014, is now integrated into Windows 10. Google Now is Google's intelligent personal assistant is available for use on its own Android-operated mobile devices and via Google Search apps downloadable on Apple devices. First launched in 2012, it can answer queries, warn users of bad traffic, and provide reminders of dinner dates and flight times.

33. Which among the following refers to the capability provided to the consumer to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider?  
(a) PaaS  
(b) SaaS  
(c) IaaS  
(d) SECaaS  
(e) MBaaS

**Sol.** PaaS vendors offer a development environment to application developers. In PaaS the consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

34. Which among the following may refer to a URL of a Web Page?  
(a) `https://www.google.com`  
(b) `https://www.news/updates.html`  
(c) `D:\Study_Notes`  
(d) `bankers.adda@gmail.com`  
(e) `select*from table`

**Sol.** `https://www.news/updates.html` represents URL of a webpage. Option (a) is URL to a famous search engine Google. Option (c) represents an address to a folder stored in a person's local D Drive of his system. Option (d) represents an email address as it has a `username@domainName` format and the last option (e) is a Structured Query Language (SQL) command for fetching all from a table.

35. Which among the following means: "Data about Data"?  
(a) Meta Data  
(b) Data Model  
(c) Hierarchical Model  
(d) Table  
(e) Relation

**Sol.** Metadata is data that describes other data. Metadata summarizes basic information about data, which can make finding and working with particular instances of data easier. Metadata for web pages contain descriptions of the page's contents, as well as keywords linked to the

content. These are usually expressed in the form of metatags.

36. Which among the following represents a Root Tag?



- (a) <H1>
- (b) <BR>
- (c) <Font>
- (d) <HTML>**
- (e) <Body>

**Sol.** The Root Element. In any markup language, the first element to appear is called the "root element", which defines what kind of document the file will be. The <html> element represents the root of a Hyper Text Markup Language document.

37. For which of the following function, ^ sign is used in MS Excel?

- (a) Summation
- (b) Exponential**
- (c) Differential
- (d) Integration
- (e) Percentile

**Sol.** ^ is the symbol for the exponential function.

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38. If you wish to see a particular area of a worksheet visible or multiple rows and columns while you scroll to another area of the worksheet, which among the following should you use?

- (a) Freeze Panes**
- (b) Freeze Columns
- (c) Freeze Rows
- (d) Freeze Worksheet
- (e) Freeze Function

**Sol.** When you freeze panes, Microsoft Excel keeps specific rows or columns visible when you scroll in the worksheet. For example, if the first row in your spreadsheet contains headers, you might freeze that row to make sure that the column headers remain visible as you scroll down in your spreadsheet.

To lock one row only, choose the View tab, and then click Freeze Top Row.

To lock one column only, choose the View tab, and then click Freeze First Column.

To lock more than one row or column, or to lock both rows and columns at the same time, choose the View tab, and then click Freeze Panes.

39. What is the maximum number, that each of the four parts of an IP Address can have?

- (a) 256
- (b) 512
- (c) 1024
- (d) 255**
- (e) 300

**Sol.** All IP addresses are made up of four parts (quadrants) separated by dots, like this: XXX.XXX.XXX.XXX Where each XXX can be any number between 0 and 255. Each of these numbers are stored in 8 bits (binary digits), and the number of possibilities you can have is 2 raised to the power of 8, which is 256 (0-255).

40. Which among the following is the process of fetching or finding data, relationships, and anomalies from a big collection of data or various databases?

- (a) Fetching
- (b) Warehousing
- (c) Mining**
- (d) Finding
- (e) Indexing

**Sol.** Data mining is the analysis of data for relationships that have not previously been discovered. Data mining is the process of finding anomalies, patterns and correlations within large data sets to predict outcomes.