

Computer Abbreviation comprises short forms of multiple important software terminologies that come under one of the most frequently asked topics in several Government exams, say Bank, Insurance, SSC, RRB. Through this article, we will bring to you the list of important computer abbreviations including computer terminologies, protocols, technology, network, memory, and database terms along with language, interface terms, followed by Server, input-output devices short form, and more. This topic would be helpful to improve your everyday knowledge in Computer Awareness as well as for the aspirants preparing for the competitive exam that includes the Computer Knowledge section. Given below is a list of numerous computer short forms or computer abbreviations with the full form for better understanding. Also, learn about [Microsoft Office](#) here.

## Computer Abbreviations List

	<b>Abbreviations</b>	<b>Full-Form</b>
A	A/D	Analog To Digital.
	ACE	Access Control Entry
	ADSL	Asymmetric Digital Subscriber Line
	AGP	Accelerated Graphics Port
	AI	Artificial Intelligence
	ALGOL	Algorithmic Language
	ALU	Arithmetic Logic Unit
	API	Application Program Interface
	APIPA	Automatic Private Internet Protocol Addressing
	APT	Automatically Programmed Tooling
	ARP	Address Resolution Protocol
	ARPANET	Advanced Research Projects Agency Network
	ASCII	American Standard Code for Information Interchange
	ASF	Advanced Streaming Format
	ASP	Active Server Pages

	ASR	Automatic Send And Receive.
	ATAPI	Advanced Technology Attachment Packet Interface
	ATM	Asynchronous Transfer Mode
	AUI	Attachment Unit Interface
AVI	Audio Video Interleave	
B	BASIC	Beginner's All-purpose Symbolic Instruction Code
	BCD	Binary Coded Decimal
	BDPS	Business Data Processing Systems
	BIOS	Basic Input Output System
	BIS	Business Information System.
	BIU	Bus Interface Unit
	BMP	Bitmap
	BPS	Bits Per Second.
C	CAD	Computer Aided Design
	CAI	Computer Aided Instruction
	CAM	Computer-Aided Manufacturing.
	CAR	Control Address Register
	CASE	Computer Aided Software Engineering
	CCIS	Common Channel Interoffice Signaling
	CCNA	Cisco Certified Network Associate
	CD	Compact Disc
	C-DAC	Centre For Development of Advanced Computing

CDMA	Code Division Multiple Access
CDROM	Compact Disc Read Only Memory
CGI	Common Gateway Interface
CGM	Computer Graphics Metafile
CIDR	Classless Inter Domain Routing
CIM	Computer Integrated Manufacture
CISC	Complex Instruction Set Computers
CLR	Common Language Runtime
CMOS	Complementary Metal Oxide Semiconductor
COBOL	Common Business Oriented Language
CORBA	Common Object Request Broker Architecture
CPI	Clock Cycle Per Instruction
CPS	Characters Per Second.
CPU	Central Processing Unit
CROM	Control Read-Only Memory.
CRT	Cathode Ray Tube.
css	Cascading Style Sheet file
D	DAC
	Digital to Analog Converter
	DBA
	Data Base Administrator
	DBMS
DCA	Database Management System
	Defense Communication Agency
DCI	Data Control Language

DDP	Distributed Data Processing	
DFS	Distributed File System	
DHCP	Dynamic Host Control Protocol	
DHTML	Dynamics HyperText Markup Language	
DNS	Domain Name System (Server)	
doc and docx	Microsoft Word file	
DOS	Disk Operating System, Denial of Service	
DPI	Dots Per Inch.	
DRAM	Dynamic Random-Access Memory	
DSL	Digital Subscriber Line	
DTP	Desktop Publishing.	
DVD	Digital Versatile Disc	
E	EEPROM	Electrically Erasable Programmable Read Only Memory
	ENIAC	Electronic Numerical Integrator and Calculator
	EPROM	Erasable Programmable Read Only Memory
F	FDD	Floppy Disk Drive
	FDMA	Frequency Division Multiple Access
	FIFO	First In First Out
	FLOPS	Floating Point Operations Per Second
	FM	Frequency Modulation.
	FO	Fiber Optics

	FORTRAN	Formula Translation.
	FPS	Frames Per Second
	FRAM	Ferro Electric Random-Access Memory
FTP	File Transfer Protocol	
G	GB	GigaByte.
	GIF	Graphic Interchange Format
	GIGO	Garbage In Garbage Out
	GUI	Graphical User Interface
H	HDD	Hard Disk Drive
	HFS	Hierarchical File System
	HPFS	High Performance File System
	HTML	HyperText Markup Language
	HTTP	HyperText Transfer Protocol
	HZ	Hertz.
I	I/O	Input / Output.
	IBM	International Business Machines
	IDE	Integrated Development Environment
	IE	Internet Explorer
	IGMP	Internet Group Management Protocol
	IO	Input-Output
	IP	Internet Protocol.
	ISAPI	Internet Server Application Program Interface

	ISDN	Integrated Services Digital Network
	ISO	International Standard Organization
	ISP	Internet Service Provider
	ISR	Interrupt Service Routine
	IT	Information Technology
ITPL	Information Technology Park Limited (India)	
J	JCL	Job Control Language
	JDBC	Java DataBase Connectivity
	JPEG	Joint Photographic Experts Group
	js	JavaScript file
	JSP	Java Server Pages
K	KB	KiloByte.
L	LAN	Local Area Network
	LCD	Liquid Crystal Display
	LSI	Large Scale Integration
	LSP	Layered Service Provider
M	MAC	Media Access Control
	MAN	Metropolitan Area Network
	MAU	Multi-station Access Unit
	MB	MegaByte.
	MDI	Multiple Document Interface
	MG	MegaBytes

	MICR	Magnetic Ink Characters Reader
	MIMD	Multiple Instruction Multiple Data
	MIME	Multipurpose Internet Mail Extensions
	MIPS	Millions Of Instructions Per Second
	MODEM	Modulator And Demodulator
	MP3	Motion Pictures Experts Group Layer 3
	MPEG	Motion Pictures Experts Group
	MS	Microsoft
	MSRAP	Microsoft Remote Administration Protocol
	MSRPC	Microsoft Remote Procedure Call
	MTS	Microsoft Transaction Server
MTU	Maximum Transmission Unit	
N	NCP	Network Control Protocol
	NDIS	Network Driver Interface Specification
	NIC	National Informatics Centre
	NIIT	National Institute Of Information Technology
	NNTP	Network News Transfer Protocol
	NS	Nano Second.
	NTP	Network Time Protocol
O	OCR	Optical Character Readers
	ODBC	Open DataBase Connectivity
	OLE	Object Linking And Embedding

	OMR	Optical Mark Reader.
	OOP	Object-Oriented Programming
	OOPS	Object-Oriented Programming System
	OS	Operating System
OSI	Open System Interconnection	
P	P2P	Peer To Peer.
	PAN	Personal Area Network.
	PC	Personal Computer
	PCB	Printed Circuit Board.
	PCI	Peripheral Component Interconnect
	PDF	Portable Document Format
	PDL	Page Description Language
	PDU	Protocol Data Unit
	PIC	Programming Interrupt Control
	PILOT	Programmed Inquiry Learning Or Teaching
	PIN	Personal Identification Number.
	PLA	Programmable Logic Array
	PLC	Programmable Logic Controller
	PNG	Portable Network Graphics
	PNP	Plug And Play
	PPP	Peer To Peer Protocol
	pps	PowerPoint slide show

	ppt	PowerPoint presentation
PROM	Programmable Read-Only Memory.	
R	RADSL	Rate Adaptive Digital Subscriber Line
	RAID	Redundant Array Of Independent Disks
	RAM	Random Access Memory
	RAMDAC	Random Access Memory Digital To Analog Converter
	rar	RAR file
	RAS	Remote Access Network
	RDO	Remote Data Objects
	RDP	Remote Desktop Protocol
	RFC	Request For Comments
	RGB	Red Green Blue
	RICS	Reduced Instruction Set Computer
	ROM	Read Only Memory
	RTC	Real-Time Clock
	RTF	Rich Text Format
	RTOS	Real-Time Operating System
S	SAM	Security Access Manager
	SAP	Service Access Point, Systems Applications Products
	SCMP	Software Configuration Management Plan
	SIM	Subscriber Identification Module

	SMP	Symmetric Multi-Process
	SMS	Short Message Service
	SMTP	Simple Mail Transfer Protocol
	SNA	System Network Architecture
	SNAP	Sub Network Access Protocol
	SNMP	Simple Network Management Protocol
	SNOBOL	String Oriented Symbolic Language
	SOAP	Simple Object Access Protocol
	SPX	Sequenced Packet Exchange
	SQA	Statistical Quality Assurance
	SQL	Structured Query Language
	SRAM	Static Random Access Memory
	SRS	Software Requirements Specification
	STP	Shielded Twisted Pair
SVVP	Software Verification And Validation Plan	
T	TB	Tera Bytes
	TCP	Transmission Control Protocol
	TCPIP	Transmission Control Protocol Internet Protocol
	TDI	Transport Data Interface
	TDMA	Time Division Multiple Access
	TPM	Transactions Processing Monitor
	TSR	Terminate And Stay Residents

txt	Plain text file	
U	UDP	User Datagram Protocol
	UML	Unified Modelling Language
	URL	Universal Resource Locator
	USB	Universal Serial Bus
	USRT	Universal Synchronous Receiver Transmitter
	UTP	Unshielded Twisted Pair
V	VAN	Virtual Area Network
	VAST	Very Small Aperture Terminal
	VB	Visual Basic
	VC++	Visual C++
	VCD	Video Compact Disc
	VDL	View Definition Language
	VDU	Visual Display Unit.
	VGA	Video Graphics Array
	VHS	Video Home System
	VLIW	Very Long Instruction Words
	VLSI	Very Large-Scale Integrated Circuits
	VPN	Virtual Private Network
	VRAM	Video Random Access Memory
	VRML	Virtual Reality Modelling Language
	VS	Visual Studio

W	WAN	Wide Area Network
	WAP	Wireless Application Protocol
	WBEM	Web-Based Enterprise Management
	WDM	Wave Division Multiplexing
	WHQL	Windows Hardware Quality Lab
	Wi-Fi	Wireless Fidelity.
	WINDOWS ME	Windows Millennium Edition
	WINDOWS NT	Windows New Technology
	WINDOWS XP	Windows Experienced
	WINS	Windows Internet Name Service
	WMI	Windows Management Instrumentation
	WML	Wireless Markup Language
	WORM	Write Once Read Many
	WSH	Windows Script Host
	WWW	World Wide Web
	WYSIWYG	What You See Is What You Get
X	XHTML	Extensible HyperText Markup Language
	XML	Extensible Markup Language
Z	zip	Zip compressed file

Learn about the [Computer Shortcut Keys](#) here. We hope that the above topic on Computer Abbreviations is helpful for your exam preparations. Stay tuned to the [Testbook app](#) for more updates on similar topics from Computer Awareness, and numerous such subjects. Also, access the test series available to test your knowledge regarding various exams.



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A computer is an electronic device that accepts data/inputs from its user and processes it into useful information as per the processing instructions to generate the output.

Computer fundamentals are an important part of the syllabus for several government exams, particularly the banking exams, railways, SSC, and more, conducted throughout the year.

Through this article, learn about the basic fundamentals of computers, their applications in various domains, advantages, and disadvantages, followed by generations and [types of computers](#).

## What is Computer?

As per our basic knowledge, an electronic device that accepts input/data and processes it into valuable information i.e output is named a computer.

### Definition of Computer

A computer is an electronic device which takes input from the user, processes it and gives the output as per user's requirement.

### Functionalities of Computer

If we consider it in a very broad sense, any digital computer performs the following five operations:

**Step 1** – Accepts data as input.

**Step 2** – Saves the data/instructions in its memory and utilizes them as and when required.

**Step 3** – Execute the data and convert it into useful information.

**Step 4** – Provides the output.

**Step 5** – Have control over all the above four steps.



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## Generations of Computer

There exist 5 computer generations to date. In the following list, approximate dates against each generation have been mentioned, which are normally accepted. These five [generations of computers](#) are based on their processing hardware.

Generations	Period	Technology Used
First Generation	1946-1959	Vacuum tube-based
Second Generation	1959-1965	Transistor-based
Third Generation	1965-1971	Integrated Circuit based
Fourth Generation	1971-1980	VLSI microprocessor-based
Fifth Generation	1980-onwards	ULSI microprocessor-based

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## Types of Computers

Computers can be classified into different types based on size, purpose, and processing power. The main types include supercomputers, mainframes, minicomputers, and personal computers.

### PC/Personal Computer

These are single-user computer systems having small, relatively reasonable computers designed for an individual user. This type of computer can easily be moved from one place to the other, comprising a personal storage unit, an input & output unit, and a Central Processing Unit.

### Workstation

Regularly a single-user system is named a workstation. Workstations usually come with a high-resolution graphics screen, inbuilt network support, a large amount of RAM, and a graphical user interface. They are often designed for self-use by an individual and can be used for multiple purposes. This type of system is not convenient for carrying from one place to another.

### Mini Computer

These come under multiple user computer systems that are capable of holding hundreds of users simultaneously.

## MainFrame

Mainframe computers are also multi-user computer systems, capable of supporting hundreds of users simultaneously; designed to be used in large firms and organizations where a lot of people have to work on the same database. Software technology is different from minicomputers.

## Supercomputer

These are extremely fast computers, which can execute hundreds of millions of instructions per second. Supercomputers are mostly used in scientific and engineering operations where processing is difficult. They are costly and complex to work on.

Learn more about other [Types of Computers](#).

# Advantages of Computer

## High Speed

- The computer is a very fast device.
- It can perform the calculation of a very huge amount of data.
- The computer has units of speed in a microsecond, nanosecond, and even the picosecond.
- It can process millions of computational calculations in a fraction of a second, unlike the man who may spend many months performing the same task.

## Accuracy

- In addition to being very fast, computers are very accurate.
- The calculations are 100% error-free.
- Computers perform all jobs with 100% accuracy, provided that the input is correct.

## Storage Capability

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It can store a large amount of data.
- It can store any type of data, such as images, videos, text, audio, etc.

## Diligence

- Unlike human beings, a computer is free from monotony, tiredness, and lack of concentration.
- It can work continuously without any error or boredom.
- It can perform repetitive tasks with the same speed and accuracy.

## Versatility

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve problems related to various fields.
- At one moment, it may be processing and simplifying a complex scientific problem, and the very next moment, it may be running a card game.

## Reliability

- A computer is a reliable machine.
- Modern electronic components have long lives.
- Computers are designed to make maintenance easy.

## Automation

- A computer is an automatic machine.
- Automation is the capability due to which a machine can perform its task without the need for human consideration. Once the program is fed to the computer, i.e., the program is held in the computer memory, then the program and instruction can be executed in the absence of human consideration.

## Reduction in Paperwork and Cost

- With the help of computers for data processing in an organization, there is a reduction of paperwork and results in speeding up the process, which in return saves trees.
- Because data saved as electronic files can be retrieved whenever required, the headache of maintaining piles of paper files gets reduced.
- While the investment at the beginning for the installation of a computer is high, it substantially reduces the cost of each of its transactions.

Know more about the [Different Versions of Windows](#) here.

## Disadvantages of Computer

### No I.Q.

- A computer is a machine that has no intelligence to perform any task.
- Each instruction has to be given to the computer.
- A computer is not capable enough to make any decision on its own.

### Dependency

- It works according to the user's instruction, thus it is entirely dependent on humans.
- Environment
- The operating environment of the computer should be dust-free and suitable.

### No Feelings

- Computers have no feelings or emotions.
- It is not smart enough to make a judgment based on experience, feeling, taste, and knowledge just like humans.

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A computer is a device that can be programmed to manipulate symbols. It replies to a specific set of instructions and can perform a pre-recorded list of instructions, say a program. Also, it can instantly store and recover large amounts of data. Computers are primarily arranged according to purpose, size, and data handling functionalities.

Through this article, we shall learn about the different types of computers and their uses with some sample questions in preparation for the approaching government/ banking exams.

Bank, RRB, Insurance, SSC, are amongst the popular exams in which questions based on the types of the computer are asked. Aspirants can effortlessly obtain marks as these questions are usually straightforward and provide ample opportunities to score.

## Types of Computers

There are different types of computer technology available these days. The functionality and data processing of each type of computer is distinct and so are the output results.

Though, the methods/techniques, size, capacity, characteristics, and data handling aspects of each computer may be different as well. Let us understand the different types of computers one by one:

Learn about [Computer Abbreviations](#) here.

### Types of Computers: Size

#### Micro Computers

The microcomputer is also recognized as a personal computer, these are comparatively economical. Microcomputers are small computers incorporating a microprocessor, Central Processing Unit (CPU), memory, storage area, an input unit, and an output unit.

It is a general-purpose computer that is outlined for personal use. Such computers are made with minimum circuitry mounting over a single circuit board. They are fit for personal work that may be making an assignment, at the office for office work, watching a movie, etc. Examples include Desktop, Laptop, tablets, smartphones, etc.

#### The Mini Frame or Mini Computer

Minicomputers are comparatively smaller than mainframe computers or can say a minicomputer lies within the mainframe and microcomputer as it is smaller than the mainframe but larger than a microcomputer.

Minicomputers are digital and multi-user computer systems with the connection of more than one CPU. Thus, multiple users can work on these computers simultaneously. Mini-frame computers are employed in institutes and work units for tasks such as billing, accounting, and record management.

#### Mainframe Computer

Computers utilized by large organisations to manage bulk data are designated as Mainframe computers. Mainframe computers are multi-programming, high-performance and multi-user computers, which implies they can manage the workload of more than 100 users at a time on the computer.

The storage capability of the mainframe is enormous, with a high-speed data process as well. The main purposes of such a type of computer include managing customer statistics, census, and other heavy data in a single device.

Mainframe computers, therefore, are mainly employed by departmental and commercial organizations like Banks, Scientific research centres, companies, and governmental departments like railways, paying employees, ticket booking, maintaining details of purchases by users, keeping detailed tax details, etc.

Learn about the [Computer Shortcut Keys](#) here.

## Supercomputer

Supercomputers come under the biggest, fastest, powerful, and most expensive type of computer for processing data type; they are designed to process an immense amount of data. A supercomputer can treat trillions of instructions/directions in a second. It has thousands of interconnected processors.

Supercomputers are especially used in scientific and engineering applications such as weather forecasting, quantum mechanics, climate research, scientific simulations, nuclear energy research, etc where a high level of performance is required.

Examples: IBM Roadburner, INTEL ASIC RED. PARAM-1000, BM Blue Gene, and CRAY-XMP-14.

## Types of Computers: Working Principle and Data Handling Abilities

### Analog Computer

Analog computers are outlined to process analog data. Analog data is continuous data that varies continuously and cannot have discrete values. Analog computers are utilized primarily to measure physical units like the voltage, electric current, pressure, temperature and convert them into digits. Such computers are mostly used for scientific, technology, research, engineering, and industrial applications.

Speedometer, mercury thermometer, thermometer, operational amplifiers, electric integrators, etc. are examples of analog computers.

### Digital Computer

The digital computer is outlined to execute calculations and logical operations at a high pace. Such computers are proficient in solving problems in discrete formats. It acquires the raw data as input is in the form of digits/binary numbers (i.e 0 and 1) and processes it with programs stored in its memory to produce the output.

It can implement arithmetic operations such as addition, occurrence, subtraction, multiplication and division, and all sorts of logical/mathematical operations as well. All modern computers like laptops, desktops including smartphones, calculators, tablets, digital watches, accounting machines, workstations, digital clocks etc that we use at home or office are digital computers.

### Hybrid Computer

Hybrid computers as the name signify exhibit features of both Analog and Digital computers. It is fast like an analog computer and has memory and accuracy like those of digital computers. It can process both continuous and discrete data. It takes analog signals and transforms them into digital form before processing them.

These types of computers are extensively used in specialized applications where both analog and digital data are processed. For example, a processor is applied in petrol pumps that converts fuel flow measurements into quantity and price. Furthermore, they are used in aeroplanes, hospitals, and scientific applications.

Also, learn about [Microsoft Office](#) here.

## Types of Computer: Purpose

### General Purpose

General computers are designed to perform various everyday tasks such as;

- Document preparation
- Financial analysis
- Printing documents
- Basic Input/Output functions
- Creating databases

- Data Saving on a smaller scale
- Calculations with accuracy and consistency.
- General performing activities

The size, storage capacity, and cost of such computers are essentially less. The capacity of these computers is limited in completing specialized tasks. These may include basic calculators, laptops, desktop computers, mobile phones, etc., which can help individuals to meet their basic essential functions.

Know more about the [Generations of Computers](#) here.

### Special Purpose

When a computer is outlined specifically to perform a certain function, such type of computer is identified as a Special Purpose computer. The size, storage capacity, and cost of such computers principally depend on the nature and size of the work. The function of these computers is consistent with any particular task, that is these computers are designed to perform a particular or specialized task.

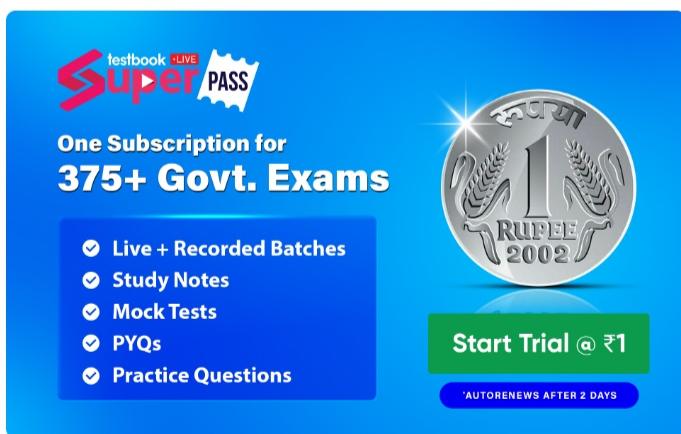
These types may include:

- Thermometers to test temperature
- Devices used for examining climate change
- Generators to manage electricity
- Large computers for IT Companies

### Examples of special-purpose computers

- Automatic teller machines (ATM)
- Traffic-control computers
- Surveillance equipment
- Weather-forecasting simulators
- Washing machines
- Military planes controlling computers
- Defence-oriented applications
- Oil-exploration systems

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The generations in computer terminology describe a change in technology (on which the computer system is designed) of a computer that is/was being used. The word “generation” was used to differentiate between various hardware technologies. Nowadays, generation encapsulates both hardware and software, which in combination makes up an entire computer system.

There exist five computer generations to date. In the following list, approximate dates against each generation have been mentioned, which are normally accepted. There are five main generations of computers based on their processing hardware.

Learn about the [Types of Computers](#) here.

## First Generation

**Period: 1946-1959; Vacuum tube-based.**

- This generation of computers worked on Machine Language that is the language of 0s and 1s and used vacuum tubes as components of memory.
- Examples of First Generation computers are:
- Mark I -The IBM Automatic Sequence Controlled Calculator (ASCC), named Mark I.
- ENIAC – Electronic Numerical Integrator and Computer
- UNIVAC- Universal Automatic Computer
- EDSAC – Electronic Delay Storage Automatic Calculator
- EDVAC – Electronic Discrete Variable Automatic Computer
- The first generation computers were large and occupied large spaces almost a room-size area.
- They were slow in processing and very expensive.
- They were not competent for multitasking, and only one task could be executed at a time.
- The electricity consumption was very high and produced lots of heat.



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## Second Generation

Period: 1959-1965; Transistor based.

- In the second generation computer, the vacuum tube was replaced by transistors.
- The input for these computers was higher-level languages like COBOL(Common Business Oriented Language), FORTRAN(Formula Translation), etc.
- Examples of second-generation computers include IBM 1620, IBM 7094, CDC 1604, CDC 3600, etc.
- The processing speed of second-generation computers was faster than first-generation computers.
- The electricity expenditure decreased with the use of transistors.

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## Third Generation

Period: 1965-1971; Integrated Circuit based.

- The third generation computers employ IC's or Integrated Circuits.
- An integrated circuit is a small device that can include thousands of devices like transistors, resistances, and capacitors, and other circuit elements built on a single thin slice of silicon elements that make up a computer.
- The invention of IC's made it possible to fit thousands of circuit elements into a small region, leading to the reduction in the size of the computers eventually.
- The IC's or Integrated Circuits had reduced the size of the computer which increased the speed of the computer.

- Examples of third-generation computers; IBM-360 series, PDP or Personal Data Processor, IBM-370, ICL 2900, etc.

You might also be interested in learning more about [Computer Storage Devices](#).

## Fourth Generation

**Period: 1971-1980; VLSI microprocessor-based.**

- The Fourth Generation of computers employed LSI (Large Scale Integration) and VLSI technology named the Very Large Scale Integrated (VLSI) circuits technology.
- These circuits lead to the development of microprocessors.
- Intel developed the first-ever microprocessor- Intel 4004 chip invented by “Ted Hoff”.
- This led to the introduction of personal computers and the first “personal computer” or PC developed by IBM.
- VLSI circuits in the fourth generation had improved the speed, memory, and storage in this generation’s computers.
- These computers were thus very compact and thereby required a small amount of electricity to run, also becoming capable of performing many high-level tasks and computations.
- Examples of fourth-generation computers are; Apple II, the first IBM computer, STAR 1000, CRAY-X-MP(SuperComputer), and many more.
- The fourth-generation saw updated versions of computers like that of laptops and tablets.
- The GUI is a Graphical User Interface that was reported during this period.

## Fifth Generation

**Period: 1980-onwards; ULSI microprocessor-Based on Artificial Intelligence.**

- The Fifth Generation computers are the present generation of computers and are the most advanced ones which have made our lives more manageable and convenient.
- The devices from the fifth generation are faster, cost-effective, utilize lesser electricity, and are effortlessly portable and convenient to use.
- Artificial intelligence is being applied in devices currently which has allowed millions of tasks to be accomplished within seconds on a device and employs the devices with the ability to think for themselves.
- The Fifth Generation computers use ULSI or Ultra-Large Scale Integration chips where millions of transistors can be placed in a single IC in ULSI chips.
- The input methods include modern high-level languages like Python, Java, R, C# and more.
- Examples of the Fifth Generation computers include Intel P 4, AMD Athlon, i 3 – i10, etc.

Also, learn about [Microsoft Windows](#) here.

## Applications of Computers

Because a computer system has a very high calculation speed, diligence, accuracy, reliability, or versatility, it became an integrated part of all business institutions.

### Business

#### Applications

A computer is very helpful in business institutions in terms of –

- Payroll calculations
- Budgeting
- Sales analysis
- Financial forecasting
- Managing employee database
- Maintenance of stocks etc.

### Banking

In the present time, banking is entirely based on computers.

Banks provide the following facilities –

- Online accounting facility, which includes checking current balance, making deposits and overdrafts, checking interest charges, shares, and trustee records.
- ATMs that are entirely automated are making this facility simpler for customers to deal with banks.

Read the complete list of [Computer Abbreviations](#), here.

## Insurance

Insurance companies are handling all records and keeping them up-to-date using computers. Entities like Insurance companies, finance houses, stockbroking firms etc., are using computers at a very high scale for their concerns.

Companies are keeping a database of all customers with information showing –

- Procedure to continue with policies
- Starting date of the policies.
- Next due installment of a policy.
- Maturity date.
- Interests due.
- Survival benefits.
- Bonus.

## Education

- The computer helps in providing a lot of facilities in the education system.
- There is a tool available on the computer for the education system known as CBE (Computer Based Education).
- CBE has many features that can be used for control, delivery, and evaluation of learning.
- Education-based on computers is transforming the way students study and in turn increasing the graph of the number of computer students.
- There are a lot of ways in which educational institutions can utilize a computer to educate the students.
- It helps to create a centralized database that stores the performance of a student and analysis is carried out on this basis.

Know everything about [Components of Computer](#), here.

## Marketing

**In advertising** – Using computers, professionals working in advertising make art and graphics, write and revise copy, and print and disseminate ads to sell more products.

**Home Shopping** – It is possible to shop while sitting at home through the use of computerized catalogs that facilitate access to product information and allow direct entry of orders to be filled by the customers

## Healthcare

The use of computers has become an integral part of hospitals, labs, and dispensaries. They are being used in hospitals to keep the record of patients and medicines.

It also aids in scanning and diagnosing various diseases. ECG, EEG, ultrasounds and CT scans, etc. are also done by computerized machines.

Computers are used in the following major fields of health care:

- **Diagnostic Systems** – Computers are used to collect data and identify the cause of illness.
- **Lab-diagnostic System** – All tests can be done and the reports are prepared by the computer.

- **Patient Monitoring System** – These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** – Computer is used to check drug labels, expiry dates, harmful side effects, etc.
- **Surgery** – These days, computers are also used in conducting surgery.

## Engineering Design

Computers are widely used for engineering purposes.

CAD (Computer-Aided Design) is one of the major areas that aid in the creation and modification of images. Some of the fields are-

- **Structural Engineering** – Needs digital stress and strain recreation and analysis for designing ships, budgets, airplanes, buildings, etc.
- **Industrial Engineering** – Computers deal with the design, implementation, and improvement of integrated systems of people, materials, and equipment.
- **Architectural Engineering** – Systems based on computers aid in planning towns, designing buildings, determination of a range of buildings on the sites with the help of both 2D and 3D drawings.

Know more about the [Difference Between RAM and ROM](#) here.

## Military

Computers are extensively used in defense in designing and controlling modern tanks, missiles, weapons, etc. They also deploy computerized control systems that are used for communication. Some areas in the military where a computer has been used are –

- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons

## Communication

It is a process to convey a message, an idea, a picture, or speech that is received and understood clearly and correctly by the person for whom it is meant. Some main areas in this category are –

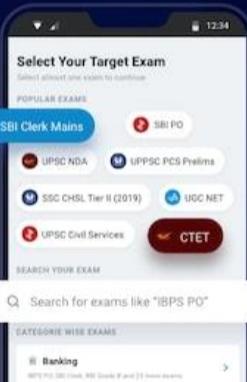
- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing

## Government

Computers perform a very important role in services related to the government. Some major fields in this category are –

- Budgets
- Sales tax department
- Income tax department
- Computation of male/female ratio
- Computerization of voters lists
- Computerization of PAN card
- Weather forecasting

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CATEGORY WISE EXAMS

Banking

Computer Aptitude is a subject included in most of the banking exams like RRB PO, SBI PO, SBI Clerk, RBI etc. It is included as a part of the logical reasoning section which consists of 45 questions (SBI PO and IBPS PO). Having knowledge of this subject could be fruitful for the candidate and thereby increase the chances of clearing an exam.

Computer Aptitude tests the candidates on their knowledge and understanding of computers and its applications.

**Computer Aptitude** consists of two parts:

1. **Computer Awareness** – This topic includes all the theoretical knowledge of the computer viz. its types, its parts, all the basic functioning, etc.
2. **Computer Aptitude** – It is an application of computer knowledge that helps in solving logical problems related to computers.

Know the basic [Computer Fundamentals](#) here.

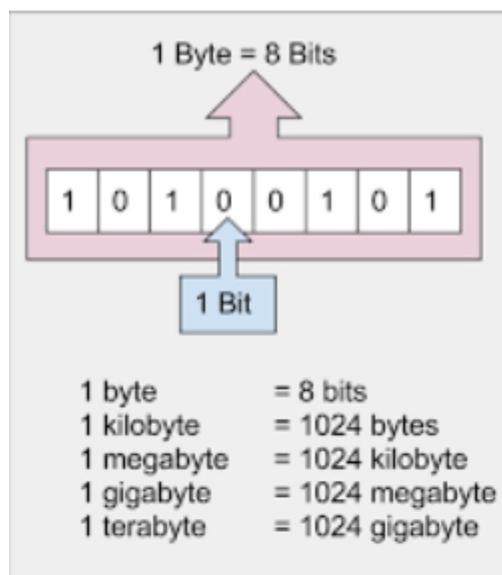
## How Does A Computer Work?

A computer takes data as input from the source through input devices and gives the result commonly known as output on output devices. It understands both numerical and non – numerical (arithmetic and logical) calculations.

### Number Systems

A way of representing numbers. In computers, every input we enter is first converted into a binary number system and then processed.

**Binary Number System** – Only two digits ‘0’ and ‘1’ are represented in the binary system which represents the ‘off’ and ‘on’ state of the computer respectively. The base used in the binary system is 2, as only 2 digits are used. Data is measured with the help of the units known as Bits and Bytes.



**BIT**



**BYTE**



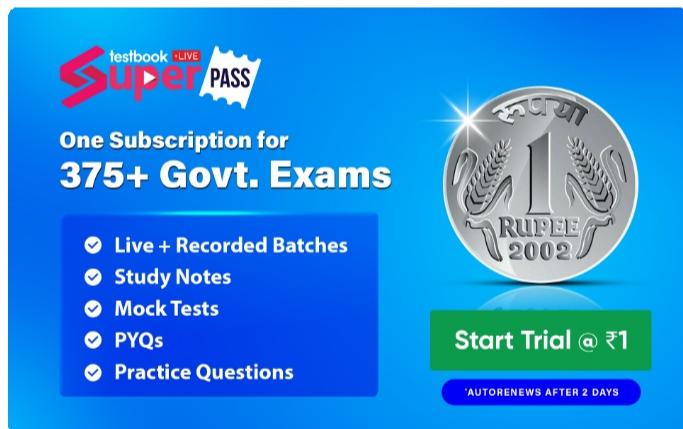
Smallest Unit

In two forms only 0 or 1

Group of 6 bits

Combination of bytes known as kilobyte and with many other names

Name	Base	Symbols	Example
Decimal	10	0,1,2,3,4,5,6,7,8,9	$(2795)_{10}$
Binary	2	0,1	111000010
Octal	8	0,1,2,3,4,5,6,7	$(1576)_8$
Hexadecimal	16	0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F	3DB



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**History of Computers**

In 1820, **Charles Babbage (Father of Modern Computers)** designed the first computing machine called the **Difference Engine**. In 1830, he designed another machine called **Analytical Machine** for calculating complicated problems by following a set of specified instructions. There are a total of 5 generations of computers till now.

## Types of Computers based on Data Handling Capabilities

- **Analog Computers** – Numerical data was represented by a measurable physical value that does not remain constant e.g. speedometer, pressure. They were used in old days.
- **Digital Computers** – It uses the binary number system and does perform calculations and logical deductions in the binary form. Sometimes, other numeral systems are also used. Are used in digital speedometers, digital signal processing, etc.
- **Hybrid Computers** – Combination of analog and digital computers. It accepts both analog and digital values as input and converts digital to analog and analog to digital information. It is used widely in ICUs, petrol pumps, etc.

Check the various [generations of computers](#) here.

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Based on the sizes and types, there are 3 [types of computers](#).

1. **Microcomputers / Personal Computers** – An electronic device with a microprocessor as its CPU. Has a single chip on which all circuits, input, output devices are connected. E.g. Laptops, Tablet
2. **Minicomputers** – More processing power than personal computers but less powerful than mainframe computers. E.g. Used for complex computations in field of science and engineering
3. **Mainframe Computers** – Large and expensive computers, which can maintain thousands or even millions of users simultaneously. E.g. are used in ATM Machines

Generations	Period	Technology
Early Period	1000 BC – 1940	Many as described above
First Generations	1940 – 1956	Vacuum Tubes
Second Generations	1956 – 1963	Transistors
Third Generation	1964 – 1971	Integrated Circuits (ICs)
Fourth Generations	1972 – 2010	Microprocessor/Very Large Scale integration
Fifth Generation	2010 – till today	ULSI Microprocessor and Artificial intelligence

## Operating System

An interface between the user and computer hardware and other software. A most important program that runs on a computer. It can perform tasks like memory allocation, controlling input and output devices.

### Types of Operating System

Based on different uses and nature, it is divided into:

1. **Single and Multitasking** – Single system only allows one program to run at a time while multitasking allows more programs to run at the same time.
2. **Single and Multiuser** – In a single user, only one user can access the computer at the same time, while in a multiuser system more than one user can access the system at the same time.
3. **Distributed** – It connects a different group of computers and makes it appear as a single computer.
4. **Network Operating System** – It includes special functions for connecting computers and devices into local area networks (LAN). E. g. UNIX, Mac OX operating system.
5. **Real-time operating System** – They are very quick and fast respondent systems. Are used there where a large number of systems are accepted and processed in a short span of time.
6. **Mobile Operating System** – It allows smartphones and other devices to run applications and programs. E. g. Apple, iOS, Google, etc.

### Functions of Operating System

Some important functions are:

- Program execution
- Interrupt Management
- Memory management

- Virtual Memory Allocation
- Networking
- Security
- Disk access and file system
- Input / Output management
- Time-Sharing

## Hardware and Software

The collection of parts that one can physically touch is called **hardware** while a set of instructions to perform a specific function in a computer is called **software**.

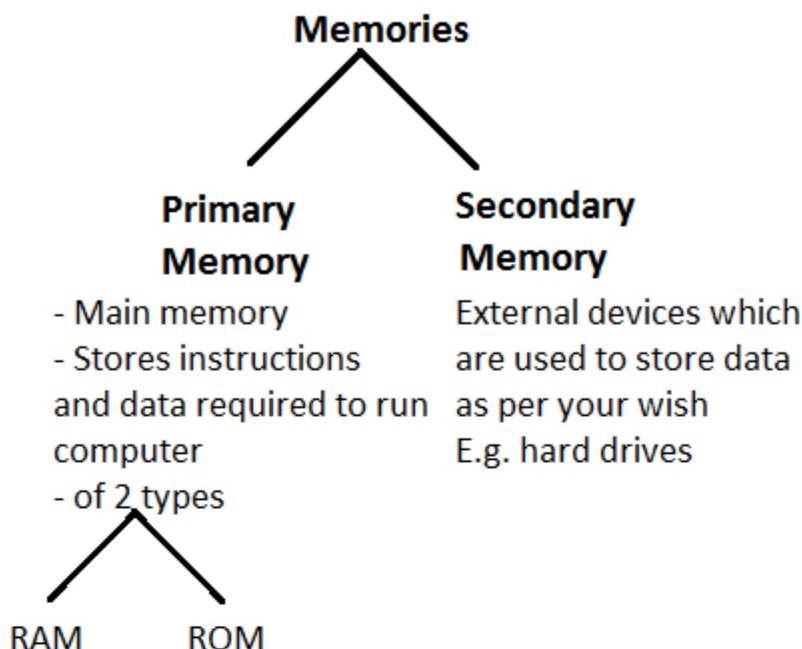
Hardware	Software
Physical parts that cause processing	Set of instructions that tell computers what to do
Four main categories – input devices, output devices, storage devices, and internal components	Mainly divided into system software, application software, and programming software
e.g. Keyboard, CPU, Mouse, Monitor	e.g. MS Word, Excel, PowerPoint

The most important part of the hardware is the Central processing unit (CPU) which is divided further into 3 parts:

- Control Unit
- Arithmetic and Logical Unit
- Memory Unit

## Types Of Storage Memories In Computer:

Storage devices are used for storing and retrieving data. Two mains types of storage devices are –



RAM (Random Access Memory)	ROM (Read Only Memory)

## 1) Volatile Memory

2) Read and writes operations on memory

3) If failure happens, data will be permanently lost

## 1) Non-volatile memory

2) Only reads data

3) Information is stored, even if the component loses power

3 types of **RAM** –

1. Dynamic RAM (DRAM)
2. Static RAM (SRAM)
3. Rambus dynamic RAM (RDRAM)

Basic Types of **ROM** are –

1. Programmable ROM (PROM)
2. Erasable Programmable ROM (EPROM)
3. Electrically Erasable Programmable ROM (EEPROM)
4. Flash EEPROM

<b>Dynamic RAM</b>	<b>Static RAM</b>	<b>Rambus Dynamic RAM</b>
Types of random access memory used in computing devices	Holds data in static form as long as the device has power	Memory is designed to transfer data at faster rates.
Writes the data at the byte level and reads data at the multiple-byte page level. Is less expensive to produce than other RAM	Provide faster access and is more expensive than DRAM. Highly recommended for use in PCs, printers, LCDs, etc.	Is made up of RAM, a RAM controller, and a bus path that connects RAM to other microprocessors and other PC devices

<b>Programmable ROM</b>	<b>Erasable Programmable ROM</b>	<b>Electrically Erasable Programmable ROM</b>	<b>Flash EEPROM</b>
Used in digital electronic devices to store permanent data	It can be erased and reused, nonvolatile memory. This is done with the help of Strong UV rays.	Requires data to be written or erased one byte at a time	Erase data in the form of blocks, nonvolatile memory

Know all about the [Difference Between RAM and ROM](#) here.

## Computer Network

It is a group of two or more computers connected together to share information and resources. **ARPANET** is the first network developed by Robert Kahn and Vinton Cart in 1969.

**Hardware components of the network** – All networks are built with basic hardware parts to interconnect network nodes.

- Network interface card
- Repeaters
- Hub
- Switch
- Bridges
- Routers

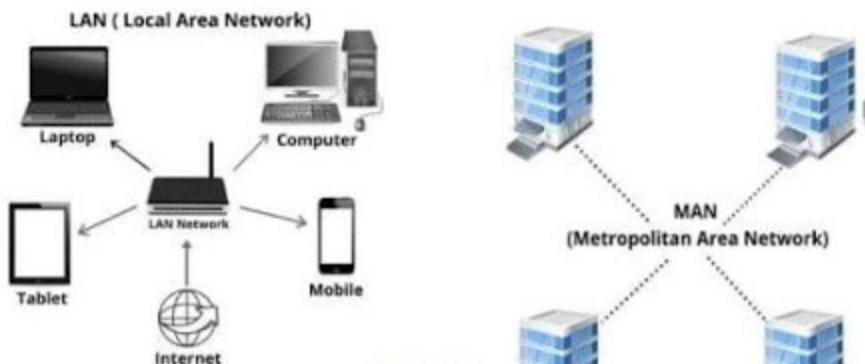
#### Network Classification:

Connection Method	Wired technology	Wireless technology
Can be classified on the basis of software and hardware technologies used for communicating computer systems. E.g. Ethernet	Cables are used for communicating. Mainly 3 types of cables are- <ul style="list-style-type: none"><li>• Twisted pair wires – e.g. telephone wires</li><li>• Coaxial cable – e.g. TV cable</li><li>• Optic fiber Cable – Used for distant communication</li></ul>	e.g. of wireless technology – <ul style="list-style-type: none"><li>• Terrestrial Microwaves – e.g. antennas</li><li>• Communication Satellites</li><li>• Cellular and PCSsystems – Used in radio transmission</li><li>• Wireless LAN – used for communicating between multiple devices in limited area</li></ul>

Learn more about the [Types of Computer Network Devices](#) here.

#### Network Classification On Basis Of Scales:

Local Area Network	Wide Area network	Metropolitan Area Network
Abbreviated as LAN, used to interconnect computers within a small geographical area such as schools, hospitals etc.	Abbreviated as WAN, used to interconnect computers within a large geographical area such as city, country	Abbreviated as MAN, used to interconnect two or more local area networks such as two cities
Owned by a single organization	Exist under collective or distributed ownership	The network uses coaxial cable or optical fiber cables and also uses hubs, routers, and switches



MAN  
(Metropolitan Area Network)



**VS**

WAN (Wide Area Network)

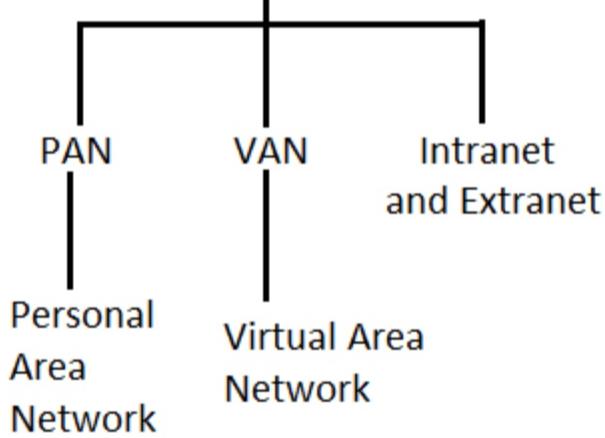


**LAN** Local Area Network

**WAN** Wide Area Network

**MAN** Metropolitan Area Network

## Networks (other types)



Know more about [Computer Network](#) here.

## Network Topology

The layout of network installation. Explains the configuration of the connection between nodes. The main types of topologies are:

- **BUS Topology:**

**BUS Topology** – Used to move one cable from the first device to the last device

**Advantages**

- All nodes are directly connected to each other, so require a short length
- Less number of cables and less expensive cables

**Disadvantages**

- Become slow with increasing networks
- Flat isolation is difficult in data transmission
- If any device connected stops working, it will hamper the whole network.

**• Ring Topology:**

**Ring Topology** – Data is transmitted in token form. All the nodes are connected in circular form

<b>Advantages</b>	Require short length cable and suitable for optical fiber cable
<b>Disadvantages</b>	If any transmission problem occurs, all the networks stop functioning  If any computer gets defective, the whole network gets affected

**• Star Topology:**

**Star Topology** – Peripheral nodes is directly connected with the central node such as the hub

<b>Advantages</b>	All the nodes are directly connected to the central node  Installation is very easy and finding the faults is also very easy  If a node fails, it will not affect other systems
<b>Disadvantages</b>	If central nodes get damaged, the whole system will be collapsed  It is difficult to expand

**• Mesh Topology:**

**Mesh Topology** – Completed interconnected technology. All the nodes are interconnected with each other

<b>Advantages</b>	Highest Fault tolerance  Perfectly suitable for long-distance networking
<b>Disadvantages</b>	Cable length and installation costs are more

**Internet:** Generally defined as a global network connecting millions of computers. It is a massive network of networks.

- **ARPANET is the first Internet network introduced by the USA. It stands for Advanced Research Project agency Networks**

Read more about [Types of Computer Network Topology](#) here.

## Programming Languages

A program is a set of instructions written in a language called Programming language.

<b>Types of Languages</b>	
<b>Procedural Languages</b>	<b>Non-procedural languages</b>
Explain the step-by-step performance of the task.	Do not consist of sequence, selection, and repetition
Consist of sequence, selection, and repetition	

<b>Classification of programming languages</b>		
<b>Machine Language</b>	<b>Assembly language</b>	<b>High-level language</b>
First-generation language  The only language that computers can understand	Second generation language  Low-level language	Third-generation language. Any program written in a high-level language is called a source program
Machine Dependent i.e. if any program is written in one computer, it cannot be executed on another computer	Machine dependent. It uses the meaningful abbreviations of words to represent basic computer instructions	Machine dependent. Must be converted into machine language before execution. Converted with the help of compiler and interpreter.

Some high-level languages are:

- COBOL (Common Business Oriented Language)
- FORTRAN (Formula Translation)
- BASIC
- PASCAL
- C
- C++
- JAVA

## Computer Architecture

It is a collection of methods and rules to perform fundamental operations. There are 3 main subcategories of computer architecture:

Computer Architecture		
Instruction Set	Microarchitecture	System Design
An embedded programming language that explains the capabilities and functions of the CPU based on the running program on either machine or assembly code.	Known as a computer organization. Defined as the implementation of the processor in the ISA (instruction set architecture).	Collection of all hardware components in the systems including data and processes. Memories are hierarchies.

**Computer programs:** There are two types of computer programs- system software and application software.

**Application Software** – It is divided into two classes and is used to perform singular or multiple tasks.

<b>Enterprise Software</b>	It explains the requirements of an organization, procedure, and information stream regularly in a large distributed environment e.g. Financial management, etc.
<b>Enterprise Infrastructure Software</b>	It can provide support to the enterprise software e.g. Email servers, Network and security management
<b>Information Worker Software</b>	Used to generate and manage information regularly for individuals e.g. resource management, word processors
<b>Content access software</b>	Labels the necessity of groups to hide digital entertainment and digital content e.g. Media players, Web browsers
<b>Educational Software</b>	It includes multimedia and the interactivity level also increases. Similar to content access software with the difference of the adoption of the content e.g. educational games, tutorial software

<b>Simulation Software</b>	Simulates the abstract system for entertainment purposes e.g. Weather conditions
<b>Media development Software</b>	Labels the necessity of people who generate, print and electronic media in the educational sector e.g. Multimedia development software
<b>Product Engineering Software</b>	Used to develop software and hardware products. Includes computer-aided design, computer-aided engineering and integrated development environments e.g. Digital camera, Smartphone
<b>Middleware Software</b>	General term for programming that serves regular programs. Connects software components and applications e.g. TCP/IP stack for telecommunication
<b>Firmware Software</b>	Used to indicate little projects and data structure that control different gadgets

**System Software:** “Low-level” computer software primarily designed to run the computer hardware and computer applications. Collects the user instructions and allows the operating system to communicate with the hardware. E. g. operating system, compilers, and assemblers

## Microsoft Office:

It was introduced by Microsoft Inc. in 1989 for the Windows operating system. Group of software mainly used for official purposes. Components of [Microsoft Office](#) are-

1. [Microsoft Word](#)
2. [Microsoft Excel](#)
3. [Microsoft PowerPoint](#)
4. [Microsoft Access](#)
5. [Microsoft Outlook](#)

## Database

A set of data that has a regular structure and that is organized in such a way that a computer can easily find the desired information. For instance, a database is a collection of records, each record contains one or more fields about some object, such as person, city, organization or sequence of DNA, etc.

### Components of the database management system (DBMS):

- Tables
- Fields
- Record
- Queries
- Forms

### Elements of database management System (DBMS):

- Entity
- Entity Set
- Attributes

- Relationships
- E-R diagram

## Types of database management Systems:

- Hierarchical databases
- Network databases
- Relational databases

### Hierarchical databases –

<b>Hierarchical databases</b>	Fast and simple. It records and contains information about their groups of parents/ child relationships just as tree structure
<b>Advantages</b>	Can be accessed and updated quickly.
<b>Disadvantages</b>	Difficult to manage ad complex implementation

**Root node → Main folder Children nodes → Subfolders**

### Network databases:

<b>Network databases</b>	In this model, entities are arranged in the graph, in which some entities can be accessed through several paths. Children are called members and parents are called occupiers
<b>Advantages</b>	Easier access due to linkage, easier to navigate and search
<b>Disadvantages</b>	Difficult for first-time users

**Relational Databases:** Data is stored in the form of tables. Data in this database is stored in the form of different access control tables, each having a key field that mainly identifies each row.

**Database Architecture:** Data Abstraction hides certain details about the data. It is also known as a data model, which is a collection of conceptual tools for describing data that is divided into three levels.

- **Physical level: Also known as internal level. Tells how data is represented and stored in the computer.**
- **Logical level:** Also known as a conceptual database. View the complete representation of the database. Explain what type of data can be stored in the database.
- **View level:** Describes the intercommunication between user and system. In this, specified data can be seen by multiple users in various ways at the same time.

<b>Advantages of DBMS</b>	<b>Disadvantages of DBMS</b>
<ul style="list-style-type: none"> <li>• Data redundancy</li> <li>• Data security</li> <li>• Data integrity</li> <li>• Data inconsistency</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of hardware and software</li> <li>• Complexity of system</li> <li>• Database failure</li> </ul>

## Uses of DBMS: DBMS is used in

- Banking – storage of customer information
- Airlines – Used for reservation and schedule information about airlines
- Universities – Storage of student information
- Telecommunication – Used for keep recording of calls and to generate mobile bills
- Human Resource Management – for storage of employer's information
- Sales – It is used for customer, product, and purchase information

## Security Tools:

Computer security is also known as cybersecurity or IT security. Protection of computer systems. There are many types of computer security software such as antivirus software, encryption software, firewall software, and spyware removal software.

## Components of Cybersecurity

<b>Confidentiality</b>	The system cannot be accessed by unauthorized users
<b>Integrity</b>	Information cannot be changed by unauthorized users
<b>Access Control</b>	Users get only permitted resources
<b>Availability</b>	Only authorized users can access the system
<b>Cryptography</b>	Art of writing data in secret or hidden format
<b>Encryption</b>	Text can be converted into ciphertext using the algorithm
<b>Decryption</b>	Converting cipher text into plain text

## Types of Virus

A computer Virus is an outward entity that affects the system to corrupt files in the form of executable files. The first computer virus was **CREEPERS** developed in **1986**

Some common types of viruses are:-

- Resident Virus – affects system at run time e.g. Randex and Meve
- Direct action virus – Virus infects the file that is mentioned in the AUTOEXEC.BAT file path e.g. Vienna virus
- Overwrite Virus – Deletes the original file and replaces it with the harmful file e.g. Way, Trj. Reboor
- Boot sector Virus – Called as Master Boot Sector Virus or Master Boot record virus. Mainly affects the boot sector of hard disk e.g. Polyboot B
- Macro Virus – Affects the files that are created by using certain applications and contain macros e.g. Melissa A
- File System Virus – Also called a cluster virus or directory virus, affects directory of the system and changes the path of the file e.g. Dir – 2 Virus
- Polymorphic Virus – Affects the system every time and encodes itself. Makes a large number of copies. E.g. Elkern, Tuareg
- FAT virus – Stores location of files. E.g. Link Virus
- Multipartite Virus – Can affect the file in multiple ways e.g. Flip Virus
- Web Scripting Virus – Affects the computer via websites and websites containing infected code e.g. J.S. Fortnight
- Phishing

## Logical Gates

## Logical Gates

Digital systems are designed by using Logical gates

The various types of logic gates are:

- AND
- OR
- NOR
- NOT
- NAND
- Ex-OR (Ex - Exclusive)
- Ex-NOR

Input		Output					
A	B	AND (.)	OR(+)	NOR	NAND	Ex-OR	Ex-NOR
0	0	0	0	1	1	0	1
0	1	0	1	0	1	1	0
1	0	0	1	0	1	1	0
1	1	1	1	0	0	0	1

NOT gate is an inverter

INPUT	OUTPUT
1	0
0	1

## Shortcut Keys:

Some of the most common shortcut keys are:

S.No.	Shortcut Keys	Function
1	Alt+F	Displays the File menu options
2	Alt+E	Opens the Edit options
3	Alt+Tab	Switch between open programs
4	F1	Used by every Windows program for Help

5	F2	To Rename a selected file
6	F5	Refresh the page or current window
7	Ctrl+D	To Bookmarks the current page (for most Browsers)
8	Ctrl+N	Create a new or blank document or open a new tab in the Internet Browser
9	Ctrl+O	To Open a file
10	Ctrl+A	Select the entire text at once
11	Ctrl+B	Change the text to Bold
12	Ctrl+I	Change the Text to Italics
13	Ctrl+U	Underline the selected text
14	Ctrl+S	Save the file or document you are working on
15	Ctrl+X	Cut selected part of the text or image
16	Shift+Del	Remove the selected items permanently.
17	Ctrl+C	To copy the text or image
18	Ctrl+V	To Paste
19	Ctrl+Y	Redo the last action
20	Ctrl+Z	Undo the last action
21	Ctrl+K	Insert hyperlink for the selected text.
22	Ctrl+P	To print the document
23	Home	Moves the beginning of the current line
24	Ctrl+Home	Moves to the beginning of the document
25	End	Moves to the end of the line
27	Ctrl+End	Moves to the end of the document

28	Ctrl+Left arrow	Moves one word to the left at a time.
29	Ctrl+Right arrow	Moves one word to the right at a time.
30	Alt+F4	To close the program currently active
31	Alt+Enter	Open the properties for the selected item
32	Ctrl + Shift + Spacebar	Create a non-breaking space
33	Ctrl + Shift+ <	Decrease font size one value
34	Ctrl + Shift + >	Increase the font size one value
35	Ctrl + [	Increase the font size by 1 point
36	Ctrl + ]	Decrease the font size by 1 point
37	Ctrl + Spacebar	Remove paragraph or character formatting
38	Ctrl + Alt + V	Paste special
39	Ctrl + Shift + V	Paste formatting only
40	Ctrl+F10	Maximize the document window
41	Ctrl + Shift + T	Enter the current time
42	Ctrl + ;	Enter the current date
43	Shift + F3	Open the Excel formula window
44	Shift + F5	Bring up the search box.
45	Ctrl + F9	Minimize current workbook
46	Ctrl + F10	Maximize currently selected workbook
47	Ctrl + F6	Switch between open workbooks/window
48	Ctrl + Page Down	Move between Excel worksheets in the same Excel document
49	Ctrl + Tab	Move between two or more open Excel files

50	Ctrl + Page Up	Move between Excel worksheet in the same Excel document
51	Alt + =	Create a formula to sum all of the cells
52	Ctrl + '	Insert the value of the above cell into the cell currently selected.
53	Ctrl + Arrow key	Move to next section to text
54	Ctrl + Space	Select entire column
55	Shift + Space	Select entire row
56	Ctrl+L	To left-align the selected text
57	Ctrl+R	To right-align the selected text
58	Ctrl+J	To justify the selected text
59	Ctrl+E	To center align the text
60	Ctrl+Del	To delete the word to the right

Explore the full list of [Computer Shortcuts](#).

## Computer Abbreviations And Acronyms:

Computer Abbreviation	Full-Form
AAC	Advanced Audio Coding
ADSL	Asymmetric Digital Subscriber Line
AGP	Advanced Graphics Port
AI	Artificial Intelligence
ALGOL	Algorithmic Language
AMD	Advanced Micro Devices
API	Application Program Interface
APT	Automatically Programmed Tooling

ARQ	Automatic Repeat Request
ASCII	American Standard Code for Information Interchange
ASP	Active Server Pages
AUI	Attachment Unit Interface
AVI	Audio Video Interleave
BASIC	Beginner's All-purpose Symbolic Instruction Code
BCC	Blind Carbon Copy
BCD	Binary Coded Decimal
BCR	Barcode Reader
BDSL	Broadband DSL
BGP	Border Gateway Protocol
BHTML	Broadcast HyperText Markup Language
BIU	Bus Interface Unit
BMP	Bitmap
BRD	Blu-Ray Disc
CC	Carbon Copy
COMPUTER	Commonly Operated Machine Particularly Used for Trade/Technology, Education, and Research.
CUI	Character User Interface
DAC	Data Acquisition and Control
E-Mail	Electronic Mail
GDI	Graphical Device Interface
GUI	Graphical User Interface

HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
INTEL	Integrated Electronics
IOP	Input-Output Processor
IP	Internet Protocol
ISP	Internet Service Provider
LED	Light Emitting Diode
MAC	Media Access Control
MICR	Magnetic Ink Character Recognition
MODEM	Modulator Demodulator
NTP	Network Time Protocol
OMR	Optical Mark Reader
PHP	Hypertext Preprocessor
PIXEL	Picture Element
PNG	Portable Network Graphics
PPP	Point to Point Protocol
RDBMS	Relational Database Management System
RIP	Routing Information Protocol
SAM	Software Asset Management
SAN	Storage Area Network
SIU	Serial Interface Unit
SMTP	Simple Mail Transfer Protocol

TCP	Transmission Control Protocol
UI	User Interface
URL	Uniform Resource Locator
USB	Universal Serial Bus
VDU	Visual Display Unit
VIRUS	Vital Information Resource Under Siege
VxD	Virtual Extended Driver
WAP	Wireless Application Protocol
WBMP	Wireless Bitmap Image
WIFI	Wireless fidelity
XML	Extensible Markup Language

Read all the [Computer Abbreviations](#) here

## Practice Questions

A person goes to an ATM to withdraw some cash. Different steps are given in the form of a flowchart. Study the information carefully and answer the given question



Q: How many maximum times can a person enter the wrong pin?

**Q. How many maximum times can a person enter the wrong pin?**

1. 3
2. 4
3. 5
4. 2
5. Cannot be determined

Solution: As it is clear from the flowchart, after 3 attempts the card will be blocked for 24 hours.

So, **the answer would be 3.**

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Computer memory is exactly like a human brain. In other words, we can say memory is an electronic holding section for the instructions and data which a computer demands to reach quickly. Memory is also seen as one of the primary functions of a computer because, without it, a computer would not be able to function accurately. Therefore it is a basic necessity to have good knowledge about computer memory and the types of computer memory.

Computer memory is subdivided into three types; Cache Memory, Primary memory(including RAM and ROM), and Secondary memory (including hard drive, CD, etc). In this article, we will focus on primary memory. Here RAM is for Random Access Memory and ROM is for Read-Only Memory. This article brings you the comparison between RAM and ROM, in all aspects.

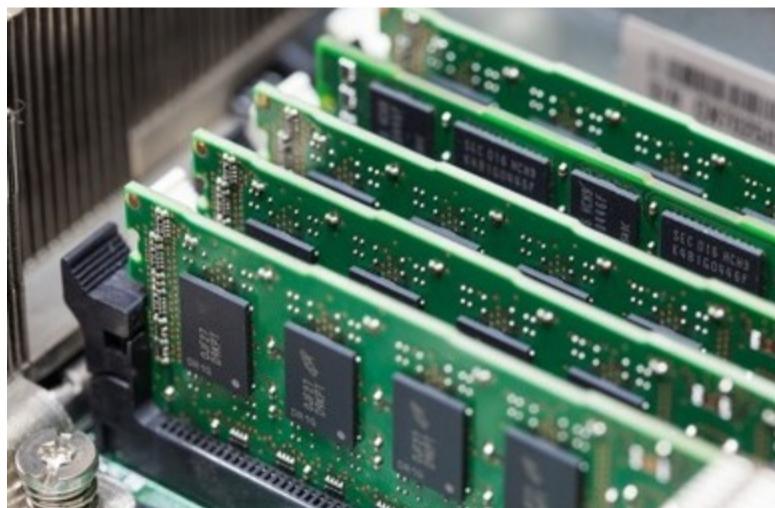
## Definition: RAM and ROM

The memory is categorized into a high number of small sections called cells. Every memory location or cell consists of a unique address that varies from 0 to memory size -1. For instance, if the computer is comprised of 64k words, then this memory entity has  $64 * 1024 = 65536$  memory locations. The memory address of these locations differs from 0 to 65535.

Learn about the [Types of Computers](#) here.

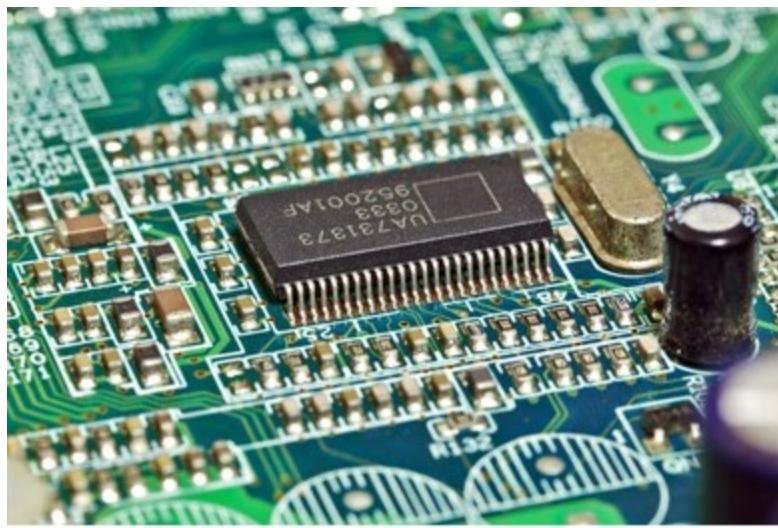
### RAM

RAM (Random Access Memory) is the kind of internal memory of the CPU for holding data, program, and program results after processing. This memory is read/write memory which holds data until the machine is supplied with power. As soon as the machine is powered off, data is dumped therefore RAM is volatile.



### ROM

ROM stands for Read-Only Memory. The memory from which the data can be read-only but rewriting it is not possible. This kind of memory is non-volatile. The data is stored permanently in such memories at the time of manufacturing. A ROM holds such instructions that are needed to turn on a computer. This process is called a bootstrap.



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## Difference Between RAM and ROM

RAM	ROM
RAM is defined as -Random Access Memory	ROM is defined as -Read-Only Memory
Random Access Memory (RAM) is costly if compared to ROM.	ROM is more inexpensive when compared to RAM.

Data stored in RAM can be modified, erased, retrieved and altered, and read.	Data stored in ROM can only be read, it cannot be revised or cancelled.
The data saved in RAM is utilized by the Central Processing Unit (CPU) to prepare current instructions.	The data collected in ROM is applied to bootstrap the computer/PC.
The capacity of Random Access Memory (RAM) is higher when compared to ROM.	ROM has a lesser capacity when compared to RAM.
Data saved on RAM can be reached by the Central Processing Unit. This states that the data stored is easily accessible.	For the CPU to access the data on ROM, first the data needs to be transferred to RAM, and then the Central Processing Unit can access the data. This implies the data stored is not as easily accessible as that in RAM.
Data of RAM is volatile, that is it will survive as long as there is no break in power. It can be said that RAM is a temporary memory of the computer.	Data available in Read-Only Memory (ROM) is not volatile, that is it is permanent and will remain constant even when there is a disturbance in the power supply. It can be said that ROM is the permanent memory of the computer.
It is employed as CPU Cache, Primary Memory in a computer.	It is utilized as Firmware by micro-controllers.
<p>Types of RAM:</p> <p>DRAM (Dynamic Random Access Memory)</p> <p>SRAM (Static Random Access Memory)</p>	<p>Types of ROM:</p> <p>PROM (programmable read-only memory)</p> <p>EPROM (erasable programmable read-only memory)</p> <p>EEPROM( electrically erasable programmable ROM)</p> <p>Mask ROM</p>

Know more about the [Generations of Computers](#) here.

## Types of RAM

- DRAM (Dynamic Random Access Memory)
- SRAM (Static Random Access Memory)

### Static RAM (SRAM)

The word static implies that the memory holds its contents as long as the electricity is being supplied and the data is dumped when the power gets down because of its volatile nature. SRAM chips are equipped with a matrix of 6-transistors and no capacitors. Transistors are not dependent on power to prevent leakage, hence SRAM need not be refreshed at a regular interval.

In the matrix, there exists an extra space, that is why SRAM consists of a high number of chips as compared to the DRAM for the same capacity of storage space, making the manufacturing costs comparatively higher. That is why SRAM is utilized as cache memory and has very fast accessing capability.

## **Characteristic of Static RAM**

- Prolonged life.
- Not necessary to refresh.
- Faster.
- Employed as cache memory.
- Large size.
- Costly.
- Huge power consumption.

Read more about [Components of Computer](#), here.

## **Dynamic RAM (DRAM)**

Unlike SRAM, DRAM needs to be constantly refreshed so that the data should be maintained. This is achieved by placing the memory on a refresh circuit that rewrites the content several hundred times every second.

DRAM is installed for most system memory as it is relatively cheap and small. All DRAMs consist of memory cells, which constitute a single capacitor and a single transistor.

## **Characteristics of Dynamic RAM**

- Small data lifetime.
- Requires to be refreshed continuously.
- Slower as compared to SRAM.
- Works as RAM.
- Smaller in size.
- Less costly.
- Less power consumption.

Few other types of RAM are:

### **Synchronous Dynamic RAM (SDRAM)**

SDRAM is a type of DRAM and works in sync with the CPU clock, which implies it waits for the clock signal before acknowledging the data input. It simply works in contrast to DRAM(responds instantly to data input). Mostly applied in Computer memory, video game consoles, etc.

You might also be interested in reading more about [Computer Storage Devices](#).

### **Single Data Rate Synchronous Dynamic RAM (SDR SDRAM)**

The ‘single data rate’ symbolises how the memory processes. It can process one read and one write instruction per clock cycle. Popularly used in Computer memory, video game consoles, etc.

### **Double Data Rate Synchronous Dynamic RAM (DDR SDRAM)**

DDR SDRAM works similar to SDR SDRAM just twice faster than it. DDR SDRAM can process two reads and two write instructions per clock cycle. Popularly used in Computer memory. The other upgraded versions of DDR SDRAM are DDR2, DDR3 and DDR4.

### **Graphics Double Data Rate Synchronous Dynamic RAM (GDDR SDRAM)**

GDDR SDRAM is a variety of DDR SDRAM and is specifically designed for Video graphics cards. The other upgraded version of GDDR SDRAM is GDDR2 SDRAM, GDDR3 SDRAM, GDDR4 SDRAM, and GDDR5 SDRAM.

## **Flash Memory**

Flash memory is a sort of non-volatile storage that holds all data after power off also. popularly used in digital cameras, smartphones and tablets, hand-operated gaming systems and toys.

Also, learn about [Computer Fundamentals](#) here.

## Types of ROM

- PROM (programmable read-only memory)
- EPROM (erasable programmable read-only memory)
- EEPROM( electrically erasable programmable ROM)
- Mask ROM.

### Masked ROM (MROM)

The early ROMs were hard-wired instruments that consisted of a pre-programmed set of data or instructions. These types of ROMs are called masked ROMs, which are comparatively inexpensive.

#### Programmable Read Only Memory (PROM)

PROM is a type of read-only memory that can be amended only once by a user. The user buys an empty PROM and inputs the required data using a PROM program. It consists of the small fuses inside which are burnt open during programming. It is possible to program this memory only once and is not erasable.

Learn more about [Types of Computer Network Devices](#), here.

#### Erasable & Programmable Read Only Memory (EPROM)

It is possible to erase EPROM by exposing it to ultraviolet light for a period of up to 40 minutes. Normally, an EPROM eraser performs this operation. An electrical charge is stored in an insulated gate region while programming. The charge is held for more than 10 years as there is no leakage path.

To erase this charge, ultraviolet light is passed via a quartz crystal window (lid). This process of exposure to UV light dissipates the charge. The quartz lid is hidden with a sticker during normal usage.

#### Electrically Erasable & Programmable Read Only Memory (EEPROM)

EEPROM can be programmed and erased using electricity. It is possible to erase and reprogram it about ten thousand times. Erasing or programming, both take about 4 to 10 ms (millisecond) time. In EEPROM, any desired location can be separately erased and programmed.

It is possible to erase EEPROMs at the rate of one byte at a time, instead of erasing the entire chip all at once. That is why the technique of reprogramming is quite flexible but slow.

### Advantages of ROM

- Non-volatile.
- Cannot be randomly changed.
- More affordable than RAMs.
- Simple to test.
- More reliable than RAMs.
- Static and do not demand refreshment.

Also, check out the notes on [MS-Excel](#), here.

We hope that the above topic on the Difference Between RAM and ROM is helpful for your exam preparations. Stay tuned to the [Testbook app](#) for more updates on similar topics from Computer Awareness, and numerous such subjects. Also, access the test series available to test your knowledge regarding various exams.

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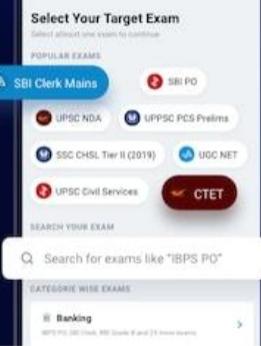


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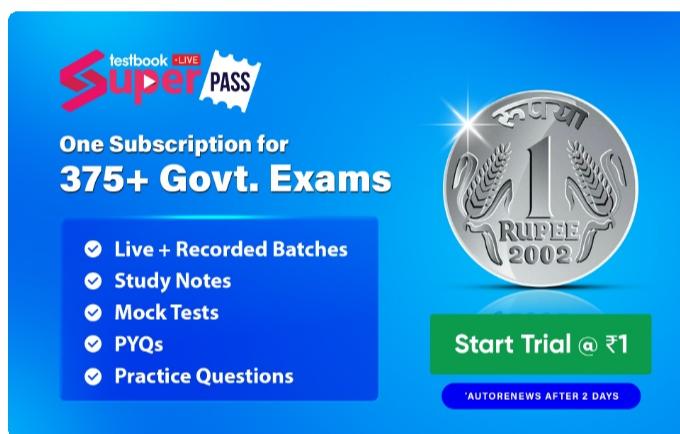
## what is an input and output (IO) device?

An input/output (I/O) device is any hardware used by a human operator or other systems to communicate with a computer. As the name suggests, input/output devices are capable of sending data (output) to a computer and receiving data from a computer (input).

Input devices allow users to interact with a computer by providing data or commands. Some common input devices include keyboards, mice, microphones, webcams, and scanners.

Output devices allow users to see, hear, or otherwise perceive the results of the computer's processing. Some common output devices include monitors, printers, speakers, and headphones.

I/O devices are essential for the operation of any computer system. They allow users to interact with the computer and provide the computer with the data it needs to function.



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## Input Devices

This part of the computer encapsulates devices with the help of which the user feeds data to the computer. It creates an interface between the user and the computer. The input devices transform the information into a form acceptable to the computer.

An input device in a computer is any piece of hardware that sends data to the computer, allowing you to interact with and control it. The data may be in the form of text, commands, images, audio, or video.

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## Output Devices

This part of the computer encapsulates devices with the help of which the user receives the information from the computer. Output devices transform the output from the computer into a form understandable by the users.

An output device is any piece of hardware that receives data from the computer. Usually, this data is used to display information to the user in some form.

Through this article Input and Output Devices, we shall review the various input and output devices which can be attached to a computer, along with their functions.

Know more about [Computer Shortcut Keys](#) here.

## Input Devices of Computer

A piece of hardware/equipment that enables the user to enter data into a computer is called an input device. Some of the Commonly used input units used in a computer system are as follows:

1. Keyboard
2. Mouse
3. JoyStick
4. Light pen
5. Track Ball
6. Scanner

7. Graphic Tablet
8. Microphone
9. Magnetic Ink Card Reader (MICR)
10. Optical Character Reader (OCR)
11. Barcode Reader
12. Optical Mark Reader (OMR)

## Input Devices



## Keyboard

The keyboard is the most basic and very commonly used input device which helps to input data to the computer. The layout of the buttons in a normally used keyboard is similar to the traditional typewriter, but there are a few additional keys provided by different manufacturers for performing additional functions.

Normally available keyboards in the market were of two sizes 84 keys and 101/102 keys, but now keyboards with 104 keys or 108 keys are also possible for Windows and Internet.

Know more about the [Difference Between RAM and ROM](#) here.

## Mouse

It is the most commonly used pointing device. It is a very famous cursor-control device and the earlier versions of it were built over a small palm-size box with a round ball at its base, which tracks the movement of the mouse and feeds digital signals to the CPU when the mouse buttons are pressed. Currently, the mouse has a sensor at the bottom to detect cursor position.

Basic versions if it has two buttons called the left and the right-click button and a wheel is present between the buttons to provide a scroll function. The movement of the mouse on a flat surface is used to control the position of the cursor on the display, but it cannot be used to feed text into the system directly.

## Advantages

1. Easy to use
2. Not very expensive
3. The cursor movement is faster than the arrow keys of the keyboard.

## Joystick

Just like a mouse, a Joystick is also a pointing device, which is used to travel the cursor position on a display. It is a perpendicular stick having a spherical ball at both lower and upper ends. The spherical ball connected at the circuit having sensors moves in a socket. The joystick controller can be traversed in all directions.

The functionality of the joystick is just like a mouse. Its applications are generally in Computer-Aided Designing (CAD) and playing computer games.

## **Light Pen**

Just like a pen, a light pen is a digital pointing device. This device is used to select an item displayed in the menu or to draw anything on the display. It contains a photocell and an optical sensor placed in a small tube at the tip.

When the light pen tip is traveled on the display, its photocell sensing element calculates the screen location and sends the digital signal to the CPU.

## **Track Ball**

The trackball is another type of input device similar to the mouse. It is most helpful with a notebook or laptop computer, instead of a mouse. It consists of a ball on the top which is half inserted and connected to the sensors. By moving fingers on the ball, the cursor can be moved.

Because the whole device is not moved to move the cursor, a trackball requires less space as compared to the mouse. This device comes in different shapes like a ball, a square, or a button.

Check out these [Microsoft office Questions for Bank PO Exam](#) here.

## **Scanner**

A scanner is another input device, which works very much like a photocopy machine. It can be used when some information on paper is to be transferred to the hard disk of the computer in digital format for further manipulation.

The scanner captures high-resolution images from the source which are then converted into a digital format that can be saved on the disk and shared digitally. These digital images can be edited before they are printed.

## **Digitizer**

A digitizer is also an input device that is used to convert analog information into digital form. Using a digitizer, the signal from the television or camera can be transformed into a series of numbers that could be saved in a computer hard drive. They can be helpful with the computer to create a picture of whatever the camera has been pointed at.

Digitizer is also called Tablet or Graphics Tablet because it transforms graphics and pictorial data into binary inputs to the system. A special kind of graphic tablet as a digitizer is used for fine works of drawing and image-related applications.

## **Microphone**

A microphone or mic is a very common input device used to input sound that is then stored in a digital form. Nowadays microphones are used in almost every industry and devices related to sound recording or transmission.

The microphone is used for different applications like adding sound to a multimedia presentation or for mixing music, voice calling and recording, video conferencing, and more.

Learn more about [Generations of computer](#), here.

## **Magnetic Ink Card Reader (MICR)**

The MICR input device is commonly seen in banks as there are a huge amount of cheques to be processed every day. The important details like the bank's code number and cheque number are printed on the cheques with specially designed ink based on the particles of magnetic material that is readable by the sensors of the machine.

This method of reading is recognized as Magnetic Ink Character Recognition (MICR). The main benefits of using MICR are that it is comparatively fast and less prone to errors.

## **Optical Character Reader (OCR)**

It is an input device that is used to read a printed text similar to the scanner, but the method of reading and the type of output generated is different. The format to be fed to the OCR is predefined and can't be used as an ordinary scanner.

OCR, unlike a scanner, scans the text optically, character by character, converts them into a machine-readable digital code instead of creating high-resolution images, and stores the text on the system memory.

## **Bar Code Readers**

Bar Code Reader is an input device used to read special format barcoded data (data in the form of light and dark lines). Barcoded data is commonly used to create price tags, in labeling goods, numbering the books, etc. It can be a handheld scanner or can be embedded in a stationary scanner on the tabletop.

A flash of light from the device strikes the surface of the object and reflects the sensors present behind the source of light to collect the input. Bar Code Reader can only scan a bar code image, converts it into an alphanumeric value, which is then transferred to the computer that the bar code reader is connected to.

## **Optical Mark Readers (OMR)**

OMR is a special type of input machine. This sort of optical scanner is used to identify the type of mark made by pen or pencil. It is used where one out of a predefined alternative is to be selected and marked.

The format to be fed to the OMR is predefined and can't be used as an ordinary scanner.

It is specially used for automation of the answer sheet analysis of examinations having multiple-choice questions.

## **Webcam**

A Webcam is a camera that is combined with a computer. Unlike a digital camera, they cannot function independently and should be connected to the computer/laptop for operation. It functions as an input device that can take pictures and is mostly used for video streaming and video conferencing or chatting.

Read more about [Computer virus](#), here.

## **Biometric Devices**

Biometrics relates to a method in which a person is identified through his/her biological features such as fingerprints, facial structure, eye cornea, etc. It is done by using biometric devices, which can be of different types based on their scanning features and abilities, such as Face Scanner, Hand Scanner, Fingerprint Scanner, Retina or Iris Scanner, Voice Scanner, etc.

## **Output Devices**

A piece of hardware/equipment that presents the result of the entered input, once it is processed, is called an output device. Several output devices display output in various ways such as images, text, hard copies, and audio/video.

Some of the Commonly used input units used in a computer system are as follows:

1. Monitor/Display Screen
2. Printer
3. Speakers/Headphones
4. Projector
5. Plotter
6. Braille Reader

## Output Devices



Monitor



Printer



Speaker



Headphone



Projector



Brail Reader



Plotter

## Monitors

Monitors or Visual Display Unit (VDU), are the primary output devices of a computer system. It generates images from tiny dots, termed pixels that are arranged in a well-defined rectangular form. The depth and sharpness of the image depend upon the number and size of the pixels.

## Printers

A printer is a very commonly practiced output device, which is used to print information on paper. There are two types of printers:

1. Impact Printers
2. Non-Impact Printers

## Projector

A projector is an optical output device that can take images produced by a computer and project or present them onto a screen or surface called a projector. In the older version of projectors, images were created by shining the light through a small transparent lens on the projector; however, the new version of projectors uses laser technology for the same. Projectors are most commonly used in offices, classrooms, auditoriums, theatres to watch presentations, videos, or pictures generated from a computer or laptop.

## Speakers

Computer speakers are the most popular output devices used with a computer to listen to sound. These speakers receive audio as input either in analog or digital form and generate sound as an output. With the advancement of technology, speakers are now available with wireless and BlueTooth facilities as well.

## Headphones

The headphones or earphones or headsets are hardware output tools that are either plugged into the computer or can be wireless. They offer the same function as a speaker, the only difference is the frequency of sound. With speakers, the sound can be detected over a larger distance while utilizing headphones, the sound is only audible to the individual using them. Headphones are available in multiple shapes and sizes.

## Plotters

A plotter is a computer output device that is primarily used to produce high-quality drawings, designs, and graphics. It is different from other printers as it uses one or more pens or markers to draw continuous lines on paper or other suitable materials, rather than using dots or pixels to create images.

## Brail Reader

## Braille reader

A Braille reader is a computer output device designed for individuals with visual impairments, specifically those who read Braille. It enables them to access digital information by converting text into Braille characters that can be read by touch.

## Difference between Input and Output Devices

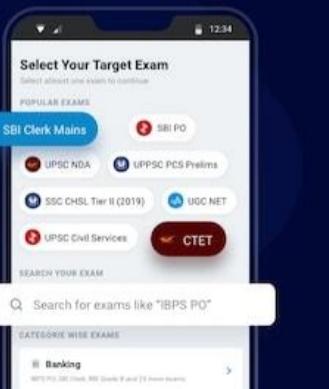
Criteria	Input Devices	Output Devices
Function	Input devices are used to provide data and control signals to an information processing system like a computer.	Output devices are used to extract or retrieve data from the computer, usually after some processing.
Data Flow	Data flows from the device to the computer.	Data flows from the computer to the device.
Types	Keyboard, Mouse, Scanner, Microphone, Webcam, etc.	Monitor, Printer, Speakers, Headphones, Projector, etc.
Use Example	A keyboard is used to input text into a computer.	A printer is used to output text or images from a computer onto paper.
Interaction	They allow users to input data into the computer for processing.	They allow the computer to present the result of this processing to the user.
Processing Requirement	They usually do not need to process data themselves; they simply capture user input and send it to the computer.	They usually process data to some extent before presenting it; for example, a printer processes text and graphics data to produce physical prints.
User Involvement	Input devices require active user involvement; without user input, they do not generally send data to the computer.	Some output devices can operate without continuous user involvement; for example, a printer can complete a print job while the user does other tasks.

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IBPS Clerk Exam	IBPS SO Exam	SBI PO Exam	SBI Clerk Exam	RBI Assistant Exam
RRB ALP Exam	RRB Technician Exam	RRB JE Exam	RRB NTPC Exam	RRB Group D Exam
UGC NET Exam	CSIR NET Exam	CTET Exam	RBI Grade B Exam	Indian Airforce Agniveer Exam
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When a sender overflows the network with too many materials then it leads to network congestion. The traffic in the network increases and becomes difficult to handle which ultimately results in a degraded quality of service (QoS). You can easily find congestion in your network by spotting the following symptoms:

- Excessive packet delay
- Packet Loss
- Packet retransmission

Following are the common causes of network congestion:

- Insufficient link bandwidth
- Legacy network devices
- Greedy network applications
- Poorly designed
- Configured network infrastructure

For instance, a large number of hosts in a LAN can cause a broadcast storm, which ultimately leads to the saturation of the network and increases the CPU load of hosts. And in a similar manner, the rest of the causes too lead to the congestion in some way or the other.

Check out [Units and Measurements](#) here.

## What is TCP?

TCP stands for Transmission Control Protocol. It is one of the prominent protocols of the Internet protocol suit. The protocol originated in the initial network implementation in which it complemented the Internet Protocol (IP). Therefore, the entire suit together is known as TCP/IP.

TCP provides you with reliable, ordered, and error-free delivery of a stream of octets between applications running on hosts communicating via an IP network. A number of internet applications rely on TCP, like, the World Wide Web (WWW), email, remote administration, and file transfer.

It is a connection-oriented protocol, and hence, before data can be sent a connection is established between client and server.



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## TCP Header Structure

Each data packet in TCP is wrapped with a header containing 10 mandatory fields totalling 20 bytes. Each header in there contains information about the connection and the current data being sent.

Following are the 10 TCP header fields:

1. **Source Port(16 bit):** The port of the sending device.
2. **Destination Port(16 bit):** The port of the receiving device.
3. **Sequence Number(32 bit):** A random initial sequence is chosen by a device that is initiating a TCP connection. According to the number of transmitted bytes the initial sequence is then incremented.
4. **Acknowledgment Number(32 bit):** An acknowledgment number that starts with zero is maintained by the receiving device. It increments this number according to the number of bytes received.
5. **Header Length(4 bit):** This is a 4 bit field that indicates the length of the TCP header by the number of 4-byte words in the header.
6. **Reserved data:** The reserved field is always set to zero.
7. **Control flags:** In order to manage data flow in specific situations TCP uses ‘ 6 ‘ 1-bit control bits for control flags. The flags are URG,PSH,RST,ACK,SYN,FIN.
8. **TCP checksum(16 bit):** A checksum is generated by the sender and is transmitted in every packet header. The checksum can be used by the receiving device for spotting errors in the received header and payload.
9. **Urgent pointer(16 bit):** When you set a URG control flag, its value reveals an offset from the sequence number, suggesting the last urgent data byte.
10. **mTCP optional data OR window size(16 bit):** These are the discretionary fields for establishing maximum segment sizes, selective acknowledgments and permitting window scaling for more effective use of high-bandwidth networks.

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## TCP Transmission and Timeout

As mentioned above, TCP connects network devices to the internet. An outbound segment is retransmitted, when it gets no acknowledgment for the data before TCP's automatic timer expires, when handed to an IP.

The thing is that this process happens most of the time, and therefore, does not cause many problems. When the retransmission timer counts down, the packet is resent, and the network continues to work along.

Talking about Timeout, then it is quite different to look at. A timeout occurs when the sender is missing too many acknowledgments and decides to take a time out and stop sending altogether. But after some amount of time, usually at least one second, the sending process starts again with one packet, then two, and so on. To put it simply enough, the timeout causes a delay of a mere one second on your network.

## Communication in TCP

As we already know that TCP allows the transmission of information in both directions. Similar to telephone communication, the computer system that communicates over TCP can send and receive data at the same time. The basic units of data transmission used by protocol are the segments. The TCP software in the network protocol stack of the operating system is responsible for establishing and terminating the end-to-end connections as well as transferring data.

Various network applications, like web browsers or servers, control the TCP software via a specific interface. Each connection must always be identified by two clearly defined endpoints i.e., client and server.

The base for establishing a valid TCP connection is that both endpoints must have a unique IP address (IPv4 or IPv6) and have an assigned and enabled the desireport for data transfer. The role of an identifier is played by the IP address, and connection to the specific client and server applications is assigned by the port operating system.

Following is the process for establishing a connection with the TCP protocol:

- A SYN packet or segment with a unique, random number is sent to the server by the requesting client. This number ensures full transmission in the correct order.
- After receiving the segment, it agrees to the connection on returning an SYN-ACK packet including the client's sequence number plus 1. Plus, it also transmits its own sequence number to the client.
- The receipt of the SYN-ACK segment is acknowledged by the client by sending its own ACK packet, which contains the server's sequence number plus 1. The client can start transferring data to the server at the same time.

## What is UDP?

UDP stands for User Datagram Protocol. It is one of the core members of the Internet protocol suite. A computer network running on UDP can send messages, known as datagrams, to other hosts on an Internet Protocol (IP) network. To set up communication channels or data paths, prior communications are not required.

UDP uses the structure of a simple connectionless communication model with a minimum of protocol mechanisms. For addressing different functions at the source and destination of the datagram it provides checksums for data integrity and port numbers. It is suitable to use for purposes where error checking and correction are either not necessary or are performed in the application.

## Communication in UDP

To get a datagram from one computer to another UDP uses IP. It works by gathering data in a UDP packet and adding its own header information to the packet. The data packet consists of the source and destination ports to communicate on, the packet length, and a checksum. They are sent off to their destination after the UDP packets are encapsulated in an IP packet.

Unlike TCP, UDP does not give you the guarantee of the packets to reach safely on the destination, as unlike TCP it doesn't connect to the receiving computer. Instead, it relies on the devices between the sending and receiving computers to send the data out.

The majority of the applications that use UDP waits for any replies that are expected because of packets sent using the communication protocol. Though, if the application does not receive a reply within a certain time frame, the application sends the packet again, or it stops trying.

A simple transmission model is used by the UDP and it does not include handshaking dialogues to provide reliability, ordering, or data integrity. In simple words, UDP's service is unreliable, and packets arrive out of order, either they have duplicates or disappear without warning.

Even after all the flaws, the service is popular.

## UDP Header Structure

While the TCP header may vary from 20 bytes to 50 bytes, the UDP header is fixed at 8-bytes. The first 8-bytes contain all necessary header information, and the remaining part consists of data. The range for port numbers is defined from 0 to 65535 as the UDP port number fields are each 16 bits long. Plus, port number zero is reserved. These port numbers help to differentiate between different user requests.

Following are the UDP header fields:

1. **Source Port:** This port is 3 Byte long field and is used to identify the port number of the source.
2. **Destination Port:** Used to identify the port of the destined packet and is 2 Byte long field.

3. **Length:** It is the length of the UDP including the header and the data and is a 16-bit field.
4. **Checksum:** It is a 2 Byte long field. It is the 16-bit one's complement of the one's complement sum of the UDP header, the pseudo header of information from the IP header, and the data, padded with zero octets at the end to make a multiple of two octets.

## Use of Ports in Communication

Port numbers are used by TCP and UDP to basically identify the end-points on a host of sending and receiving applications. It is often known as Internet sockets. An associated 16-bit unsigned port number reserved by the sending or receiving application is on each side of a TCP connection. Arriving TCP packets are identified as belonging to a specific TCP connection by its sockets, that is, the combination of source host address, source port, destination host address, and destination port.

This means that, if a client takes care of initiating any simultaneous connections to one destination port from different source ports, the server computer can provide several clients with several services simultaneously.

There are three basic categories into which port numbers can be categorized:

- Well-known
- Registered
- Dynamic/Private

**Well-known Ports:** They are assigned by the Internet Assigned Numbers Authority (IANA) and are typically used by system-level or root processes.

Examples: FTP (20 and 21), SSH (22), TELNET (23), SMTP (25), HTTP over SSL/TLS (443), and HTTP (80).

**Registered Port:** These ports are generally used by the end-user applications as ephemeral source ports when contacting servers. Plus, they can also spot named services that have been registered by a third party.

Examples: Shockwave (port number 1626).

**Dynamic/Private Ports:** It can be used by end-user applications, but not so often. They do not contain any meaning outside of any particular TCP connection.

Example: Network Address Translation

## Difference between TCP and UDP:

TCP	UDP

1. It is a connection-oriented protocol.

2. TCP reads data as streams of bytes, and the message is transmitted to segment boundaries.

3. TCP messages make their way across the internet from one computer to another.

4. TCP rearranges data packets in a specific order.

5. The speed for TCP is slower.

6. Header size is 20 bytes.

7. TCP does error checking and makes error recovery.

8. Acknowledgment segments.

9. Using handshake protocols like SYN, SYN-ACK, ACK.

10. TCP is reliable as it guarantees the delivery of data to the destination router.

1. It is a connectionless protocol.

2. UDP messages contain packets that were sent one by one. It also checks for integrity at the arrival time.

3. It is not connection-based, so one program can send lots of packets to another.

4. UDP protocol has no fixed order because all packets are independent of each other.

5. UDP is faster as error recovery is not done.

6. Header size is 8 bytes.

7. UDP performs error checking, but it discards erroneous packets.

8. No Acknowledgment segments.

9. No handshake.

10. The delivery of data to the destination can't be guaranteed in UDP.

## What is Congestion?

Congestion is a state occurring in the network layer when the message traffic is so heavy that it slows down network response time.

Following are the effects of congestion:

- As delay increases, performance decreases.
- If delay increases, retransmission occurs, making the situation worse.

## Congestion Avoidance

Congestion control and congestion avoidance techniques are used by networks to avoid collapse. These include exponential backoff in protocols such as CSMA/CA in 802.11 and the similar CSMA/CD in the original Ethernet, window reduction in TCP, and fair queuing in devices such as routers and network switches.

## Additive-Increase/Multiplicative Decrease (AIMD)

AIMD is an algorithm feedback control algorithm. It is often known for its application in TCP congestion control. It combines linear growth of the congestion window with an exponential reduction when congestion is detected.

## Fast Retransmit

It is an enhancement to TCP that reduces the amount of time a sender waits before retransmitting a lost segment. The base of the fast retransmit mechanism is the duplicate acknowledgment. After a packet is received by the receiver an acknowledgment is sent for the last-in-order byte of data received.

## Slow Start

Slow Start is a part of the congestion control strategy used by TCP to avoid causing network congestion. It is used by TCP in conjunction with other algorithms to avoid sending more data than the network is capable of.

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The devices which are employed for interaction between various hardware applied in the computer network are called network devices. There are various types of electronic devices practiced in networking which are identified as network devices/network equipment. In a computer network, network devices are essentially used for conveying and collecting the data quickly and securely in between computers, printers, fax machines, etc.

Some of these devices can be connected to the internetwork and some can be part of the network. These devices are particularly designed to handle digital or electrical connections to perform their roles efficiently. This article brings to you detailed information on Network Devices including hub, switch, bridge, routers, and more.

Know more about [Internet](#), here.

## Network Devices

### HUB

Hub is considered as one of the basic icons of networking devices which is implemented at the physical layer and hence connects networking nodes physically together. Hubs are fundamentally utilized in networks that use twisted-pair cabling to connect nodes.



They are created in a way to send the packets to the other appended devices without editing any of the transmitted packets received. They work as pathways to direct electrical signals to travel along. They transmit the information without caring of fact that the data packet is destined for the device linked or not.

### Hub falls into two categories

#### Active Hub

They are more advanced than the passive hubs. They not only facilitate the path for the data signals, but they also regenerate, concentrate and strengthen the signals before transmitting them to their destinations. Active hubs are also called ‘repeaters’.

#### Passive Hub

They are similar to the point contact for the wires to build in the physical network. They have no work of modifying the signals.

#### Ethernet Hubs

It is a device linking various Ethernet devices together and makes them carry on the functions as a single device. They are different in speed in terms of data transfer rate. Ethernet utilizes the so-called Carrier Sense Multiple Access with Collision Detect (CSMA/CD) to control Media access. The Ethernet hub connects in a “half-duplex” mode where the possibility of data collision is inevitable most of the time.

Learn about the [Computer Network](#) here.

## Switches

Switches work as the connection points for an Ethernet network. Just like in the hub, devices in switches are linked to them through twisted-pair cabling. But the variation shows up in the manner both the devices, hub and a switch, take the data. Hub works by sending the data to all the ports on the device whereas a switch transfers it only to that port that is linked to the destination device.





A switch does so by having in-built learning of the MAC address of the devices linked to it. Since the sending of data signals is predefined in a switch, therefore the network performance is consequently effective. Switches work in a "full-duplex" mode where nodes can send and receive data from the switch simultaneously unlike in half-duplex mode.

The transmission bandwidth in switches is double as compared to the Ethernet hub transferring around 20Mbps connection into 30Mbps and around 200Mbps connection to become 300Mbps. Performance enhancements are observed in networking with the extensive utilization of switches in recent days.

The given method will elucidate further how data transmission takes place via switches:

1. **Cut-through transmission:** It enables the packets to be transmitted as soon as they are received. The technique is prompt and quick but the facility of error checking gets overlooked in these kinds of packet data transmission.
2. **Store and forward:** In this switching technique the entire packet is taken and 'checked' before being transmitted further. The errors are thus eliminated before being propagated further. The drawback of this process is that error checking spends a relatively long time consequently resulting in a bit slower processing and delivery.

3. **Fragment Free:** In a fragment-free switching environment, a greater part of the packet is examined so that the switch can identify whether the packet has been caught up in a collision. After the collision status is identified, the packet is forwarded.

Read more about the [Difference between RAM and ROM](#)

## Bridges

A bridge is a type of computer networking component that builds the connection with the other bridge networks that are present on the same protocol. It is implemented at the Data Link Layer of the OSI Model and links the different networks together and creates communication between them. It combines two local-area networks; two physical LANs into bigger logical LANs or two segments of the already existing LAN that use the same protocol.

Apart from creating larger networks, bridges are also utilized to segment bigger networks into smaller portions. The bridge performs this by placing itself between the two portions of two physical networks and managing the flow of the data between them.

### Types of Bridges

There are three types in which bridges can be segmented:

1. **Transparent Bridge:** As the name implies, it resembles being transparent for the other devices on the network. The other devices are ignorant of their existence. It only restricts or permits the data according to the MAC address.
2. **Source Route Bridge:** It received its name from the fact that the way which packet takes via the network is implanted within the packet. It is mainly utilized in Token ring networks.
3. **Translational Bridge:** The process of conversion happens via Translational Bridge. It transforms the data format of one network to another. For example, conversion of Token rings to Ethernet and vice versa.

## Switches Superseding Bridges

Ethernet switches are gaining trend consecutively as compared to bridges. They are progressing in terms of logical divisions and segments in the networking area. Switches are being referred to as multiport bridges because of their high-level functionality.

Also, learn about [Types of Computer Network Topology](#) here.

## Routers

Routers are network layer components and are particularly categorized as Layer- 3 components of the OSI Model. They work on logical addressing information in the Network header of a packet like IP Addresses.



A router is utilized to implement bigger complex networks by complex traffic routing. It has the authority to connect dissimilar LANs on the same protocol. It also has the authority to restrict the flow of broadcasts. A router mainly comprises a hardware component or a system of the computer which has multiple network interfaces and routing software.

## Functionality

When a router receives the data, it analyses the destination address by checking the header of the packet. Once the address is analyzed, it finds in its routing table to know how to connect to the destination and then transmits the packet to the higher hop on the route. The hop might be the last destination or another router.

Routing tables play a very crucial role in enabling the router to make a decision. That is why a routing table needs to be updated and complete. The two methods using which a router can receive data are:

1. **Static Routing:** In static routing, the routing information is fed into the routing tables manually. It is not only a time-taking task but gets prone to mistakes as well. Manual updating is also required in the case of statically configured routers when a change in the topology of the network or the format takes place. Thus static routing is considered for the smallest environments with the least number of routers.
2. **Dynamic Routing:** For a larger environment dynamic routing proves to be the practical solution. The process includes the use of peculiar routing protocols to establish communication. The purpose of these protocols is to facilitate the routers to transmit information to other routers so that the other routers can build their routing tables.

You might also be interested in learning more about [Computer Storage Devices](#).

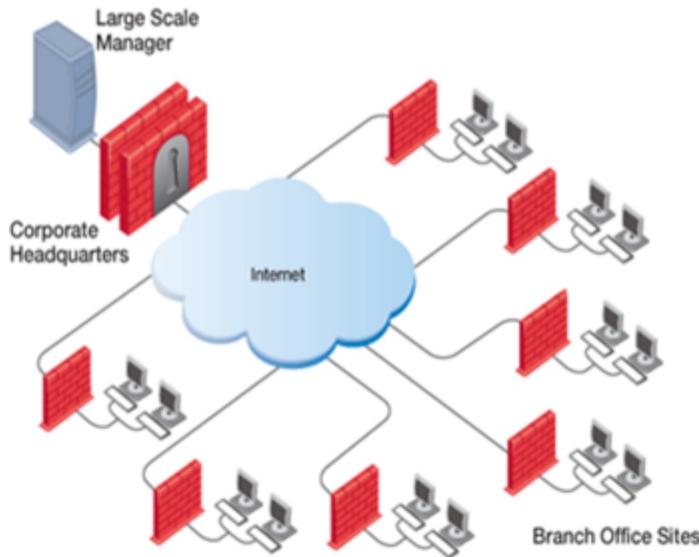
## Brouters

Brouters are the collaboration of bridges and routers. They take up the functionality of both networking components working as a bridge when forwarding data between networks and serving as a router when routing information to individual systems. Brouter works as a filter that permits some data into the local network and redirects unknown packets to the other network.

These days Brouters are not used because their functionality is embedded into the routers to work as bridges as well.

## Gateways

Gateway is a device that is implemented to combine multiple networks and transmits packets from one network to the other network. Working as the ‘gateway’ in the middle of different networking systems or computer programs, a gateway forms a link between them.



It facilitates computer programs, either on the same device or on a different device to share information across the network via protocols. A router is also a kind of gateway because it interprets data from one network protocol to another.

Other components such as a bridge translate the data into different forms among two networking systems. Then a software application transforms the data from one format into another. Gateway is a crucial tool to translate the data format, even though the data itself remains unchanged. Gateway might be implemented in some other device to add its functionality into another.

Know more about the [Computer Virus](#) here.

## Network Card

Network cards are sometimes referred to as Network Interface Cards (NICs). These are hardware components that link a computer with the network. They are installed on the motherboard. They work to develop a physical connection of the network to the computer. Computer data is transformed into electrical (analog) signals sent to the network via Network Interface Cards.



They are also able to manage some important data-transformation functions. These days' network cards are software controlled unlike in older days when drivers were required to configure them.

Learn about the [Types of Computers](#) here.

## Modems

A modem is a device that transforms computer-generated digital signals into analog signals to enable their traveling through phone lines. The 'modulator-demodulator or modem may work as a dial-up for LAN or connect to an ISP.

Modems can be both external, as in the device which correlates to the USB or the serial port of a computer, or proprietary elements for handheld smart appliances and other devices, and as internal, in the form of add-on expansion cards for computer systems and PCMCIA cards for laptop computers.



The design of a modem varies for both the external and internal modem. In internal modems, IRQ – Interrupt request is utilized to configure the modem in addition to I/O, which is a memory address. Usually, before the installation of the built-in modem, integrated serial interfaces are disabled, assigning them the COM2 resources at the same time.

For external types of modem, the modem assigns and uses the resources itself. This is especially helpful for the USB port and laptop users as the non-complex and simpler nature of the process renders it far much more useful for daily usage.

The modem working efficiency and processing is decided by two factors:

1. Speed of UART –An acronym for Universal Asynchronous Receiver or Transmitter chip (installed on the motherboard to which the modem connection is established)
2. Speed of the modem itself.

## RJ45 Connector

Devices in a wired network are ordinarily connected physically to a server, router, modem, or each other with Ethernet cables. The individual end of an Ethernet cable has a connector named an RJ45 connector.

RJ45 is a kind of connector generally applied for Ethernet networking. It resembles a telephone jack but is somewhat wider. As Ethernet cables have an RJ45 connector on each terminal, Ethernet cables, therefore, are identified as RJ45 cables. The “RJ” in RJ45 stands for “registered jack,” as it is a standardized networking interface.

Know more about the [Generations of Computers](#) here.

## Firewall

A firewall is a network protection device that controls incoming and outgoing network traffic and determines whether to allow or block specific traffic based on a determined set of security rules. A firewall can be hardware, software, or both. A firewall builds a boundary between secured internal networks and outside untrusted networks, such as the Internet.

### Types of firewalls

1. Proxy firewall
2. Stateful inspection firewall
3. Unified threat management (UTM) firewall
4. Next-generation firewall (NGFW)
5. threat-focused NGFW

Read the complete list of [Computer Abbreviations](#), here.



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## Which Device Works on Which Layer

1. HUB works in the physical layer(Layer 1) of the OSI model.
2. Switches operate in the data link(Layer 2) layer of the OSI model.
3. Bridge operates at the data link layer of the OSI model.
4. The router is essentially a Network Layer device.
5. Gateways operate at the network layer of the OSI model.
6. Brouter can work either at the data link layer or a network layer.
7. NIC card works on both the physical and data link layer of the OSI model.
8. The firewall operates on the network layer of the OSI model.
9. RJ45 works on the Physical Layer of the OSI model.

We hope that the above article on Types of Computer Network Devices is helpful for your knowledge and exam preparations. Stay tuned to the [Testbook app](#) for more updates on similar topics from Computer Awareness, and numerous such subjects. Also, access the test series available to test your knowledge regarding various exams.

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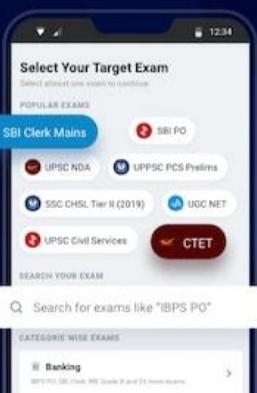


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A computer network is defined as a collection of computers connected that follow similar protocols and allow the computer to interact with another computer and share its resources, data, and applications.

A network topology defines the physical interconnection of its constituent elements. We can say that the topology of a network defines how the various nodes of the network are interconnected. Here the interconnection can be real or logical. The term Real implies physical or actual connection and logical interconnection refers to the way data is exchanged between the constituents.

With this article, we will learn the different types of network topology- Bus, Star, Mesh, Ring, Tree, and Hybrid, their orientation and uses.

## Types of Network Topology

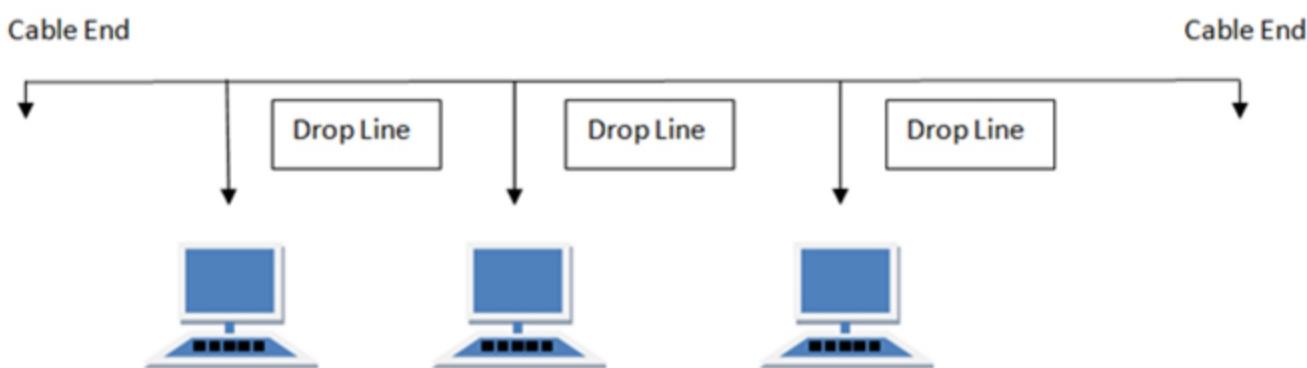
The way to arrange or connect patterns of computers/nodes/devices used in the network is known as network topology. The common types of network topologies are as follows:

1. Bus topology
2. Star Topology
3. Ring Topology
4. Mesh Topology
5. Tree Topology
6. Hybrid Topology

Learn more about the [Computer Network](#) here.

## BUS Topology

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



### Features of BUS Topology

1. It sends data only in one direction.
2. Every device is linked to a single cable.

### Advantage of BUS Topology

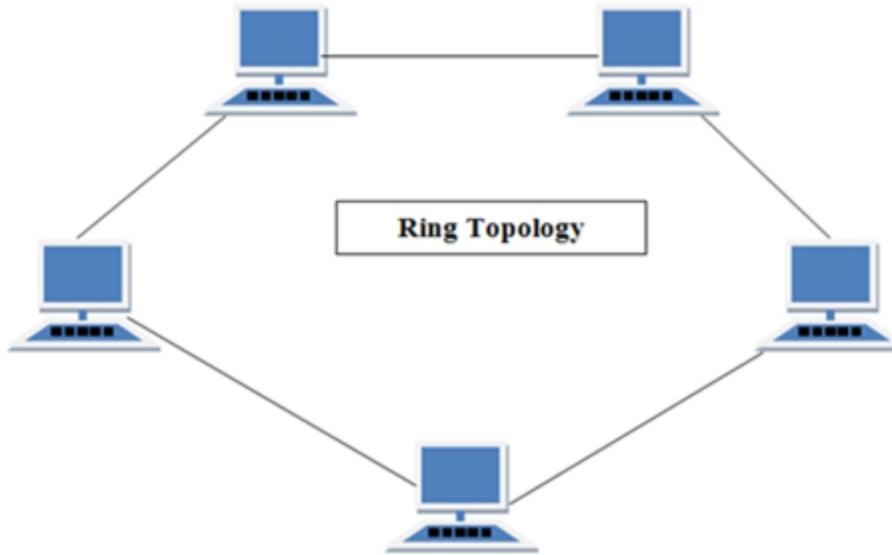
1. Cost-effective.
2. Cable requirement is minimal as compared to other topologies.
3. Useful in small networks.
4. Easy to understand.
5. Easy to expand by connecting two cables.

## The Disadvantage of BUS Topology

1. The whole network fails if cables fail.
2. The performance of the network decreases in case network traffic is heavy or nodes are more or the cable has a limited length.
3. It works slower as compared to the ring topology.

## RING Topology

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



### Features of RING Topology

1. The multiple numbers of repeaters are installed for Ring topology with a high number of nodes, because if one node wants to send some data to the last node in the ring topology with more nodes like 100 nodes, then the data will have to travel through 99 nodes to reach the 100th node. Hence repeaters are used in the network to prevent data loss.
2. The transmission is in one direction, but it is possible to implement bidirectional transmission by having 2 connections between each Network Node, therefore also known as "Dual Ring Topology".
3. In the case of Dual Ring Topology, two ring networks are created, and data flow is in the opposite direction.
4. Hence, if the ring in one direction fails, the second ring can work as a backup, to keep the network working.
4. Data is transmitted in a sequential manner that is bit by bit. Data transmitted, has to go through each node linked in the network, till the final node.

### Advantage of RING Topology

1. Transmitting network is not affected by huge traffic or by the addition of more nodes, as only the nodes having tokens(short message) are allowed to transmit data.
2. Low cost to install and expand.

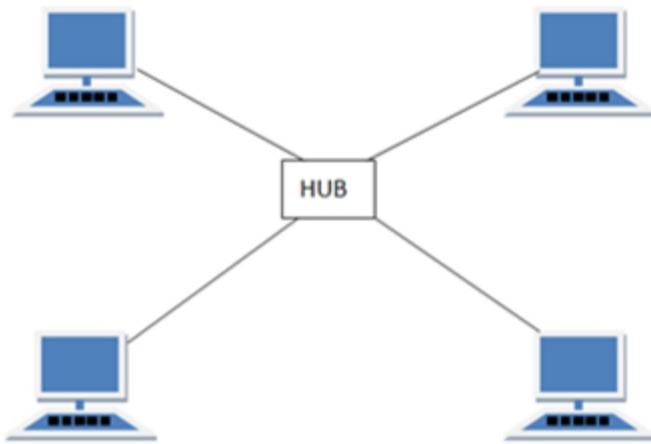
### The Disadvantage of RING Topology

1. Troubleshooting is not simple in a ring topology.
2. The addition or removal of the computers interferes with the other nodes and network activity.
3. The crashing of one node affects the whole network.
4. Initial installation cost is high therefore not applied at low-density traffic.

Also, learn about the [Types of Computer Network Devices](#) here.

## STAR Topology

In Star Topology all the nodes are linked to a common hub via a cable. This hub is the central node and all other nodes are linked to the central node. Unlike Mesh topology, star topology does not permit straightforward communication between the devices, a device needs to communicate through the hub. If a device requires sending data to another device, it has to first transfer the data to the hub, and then the hub forwards that data to the selected device.



### Features of STAR Topology

1. Each node has its unique connection to the hub.
2. Hub works as a repeater for data transmission.
3. Can be utilized with twisted pair, Optical Fibre, or coaxial cable.

### Advantage of STAR Topology

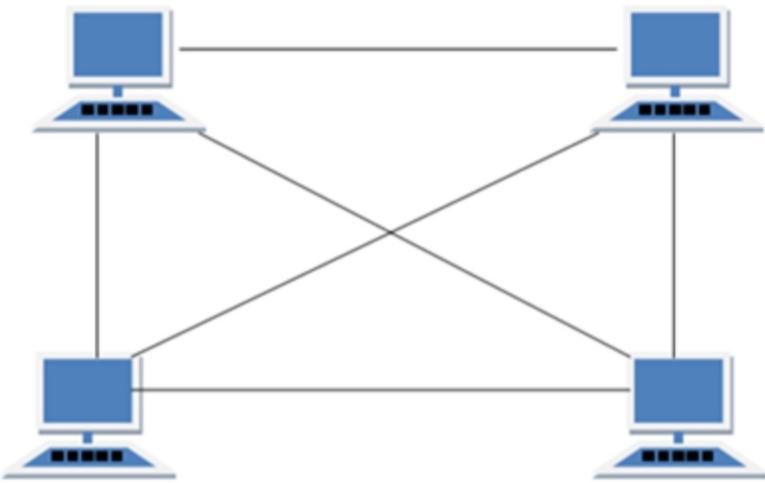
1. Speedy performance with less number of nodes and low network traffic.
2. Hub can be easily upgraded without hassle.
3. Simpler to troubleshoot.
4. Simpler to set up and modify.
5. If there is a failure in one node then the failed node is only affected, and the rest of the nodes can work without any issues.

### The Disadvantage of STAR Topology

1. Expensive to install.
2. Expensive in usage.
3. If the hub crashes then the entire network is stopped because all linked nodes depend on the hub.
4. Efficiency is dependent on the hub, that is it depends on its capacity.

## MESH Topology

In a mesh topology, every device is correlated to every other device on the network by a dedicated point-to-point connection. Mesh consists of  $n(n-1)/2$  physical channels to link  $n$  number of devices. For the same  $n$  devices in the network, each device contains  $(n-1)$  input and output ports.



There are two types of methods to transmit data via the Mesh topology, they are :

1. Routing
2. Flooding

#### **MESH Topology: Routing**

In routing, the linked computers have a routing logic, as per the network need. Like routing logic to direct the data to transmit to the destination via the shortest distance. Or, routing logic which has info related to the broken links, and it neglects those nodes, etc. We can even use routing logic, to re-configure the crashed nodes.

Know more about the [Computer Virus](#) here.

#### **MESH Topology: Routing**

In flooding, the exact data is sent to all the network nodes, hence no routing logic is needed. The network is robust, and data loss is very unlikely. But it results in unwanted load over the network.

#### **Types of MESH Topology**

1. **Partial Mesh Topology:** In this type of topology few of the systems are linked similarly to mesh topology but few nodes are only linked to two or three devices.
2. **Full Mesh Topology:** Every node or device is linked to each other.

#### **Features of MESH Topology**

1. Fully lined.
2. Robust.
3. Not flexible.

#### **Advantage of MESH Topology**

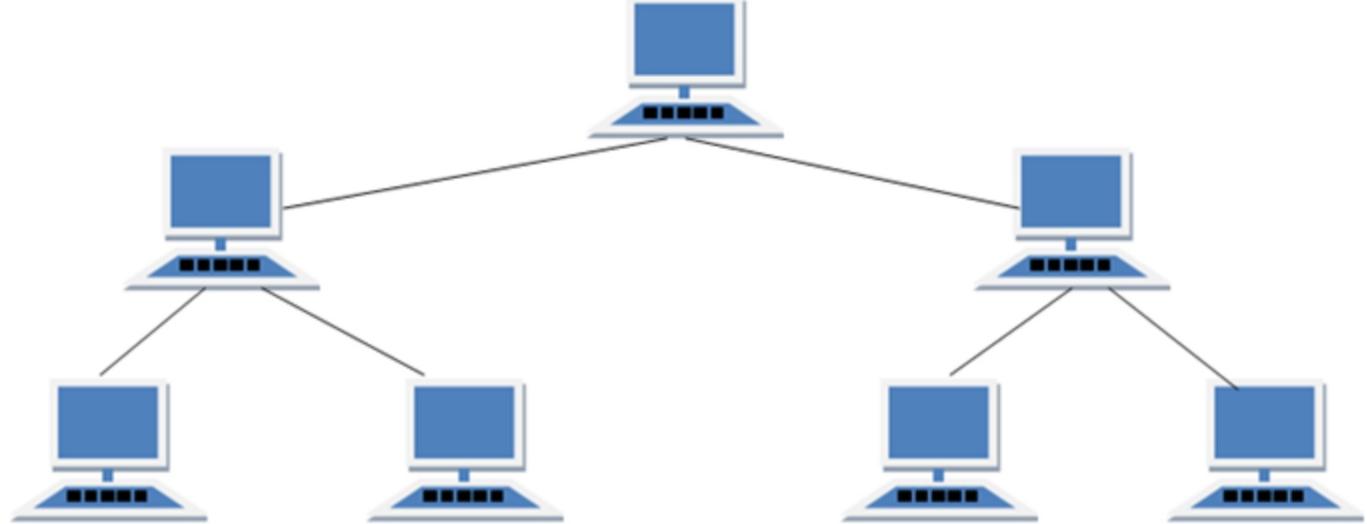
1. Each connection may carry its unique data load.
2. It is robust.
3. Fault can be diagnosed easily.
4. Facilitates security and privacy.

#### **The Disadvantage of MESH Topology**

1. Installation and configuration are not simple.
2. Cabling cost is higher.
3. Bulk wiring is needed.

#### **TREE Topology**

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



### Features of TREE Topology

1. Ideal if workstations are situated in groups.
2. Useful in Wide Area Network.

### Advantage of TREE Topology

1. Extension of bus and star topologies.
2. Expansion of nodes is possible and easy.
3. Easily managed and maintained.
4. Error detection is easily done.

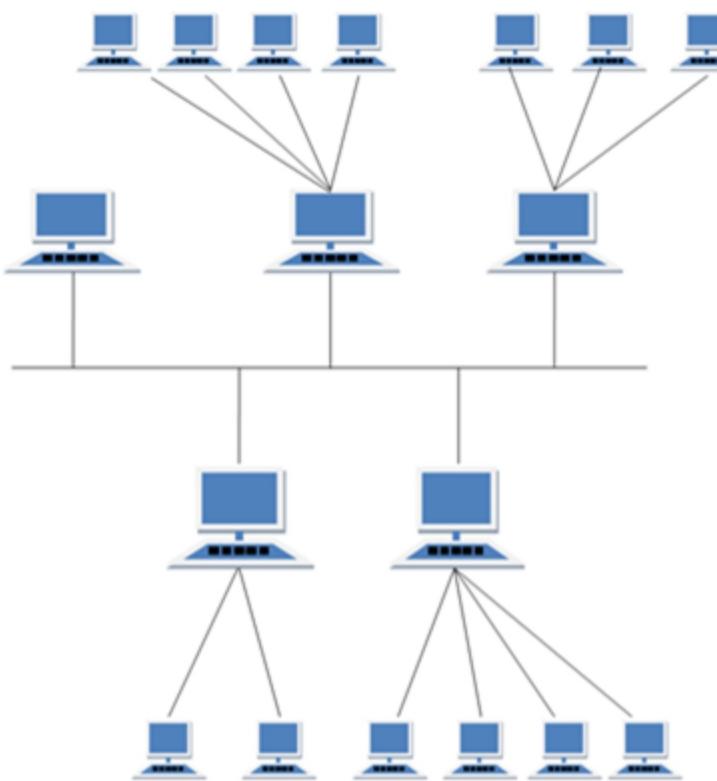
Also, learn about [Computer Fundamentals](#) here.

### The Disadvantage of TREE Topology

1. Heavily cabled.
2. Costly.
3. If additional nodes are introduced, maintenance is difficult.
4. If the central hub fails, the network fails.

## HYBRID Topology

It is two different kinds of topologies, which is a combination of two or more topologies. For example if in an office in some department ring topology is used and in another department in the same place, star topology is used, connecting these topologies will form a Hybrid Topology (ring topology and star topology).



### Features of HYBRID Topology

1. It is an encapsulation of two or more topologies
2. Inherits the benefits and disadvantages of the topologies included.

### Advantage of HYBRID Topology

1. Reliable because Error detecting and troubleshooting are easy.
2. Effective.
3. Scalable as size can be increased easily.
4. Flexible.

Learn about the [Types of Computers](#) here.

### The Disadvantage of HYBRID Topology

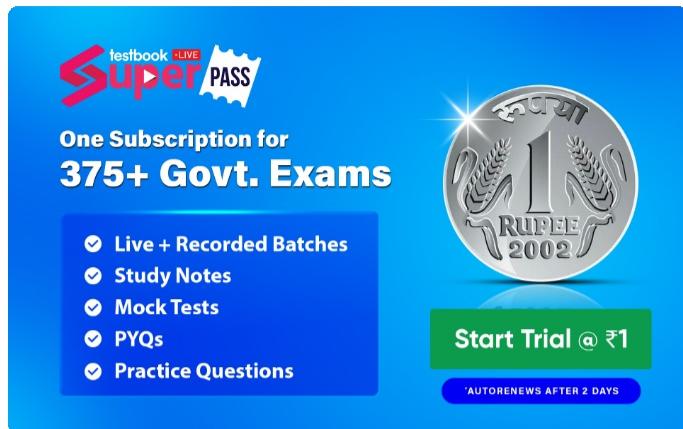
1. Complex in design.
2. Costly.

We hope that the above article on Types of Computer Network Topology is helpful for your knowledge and exam preparations. Stay tuned to the [Testbook app](#) for more updates on similar topics from Computer Awareness, and numerous such subjects. Also, access the test series available to test your knowledge regarding various exams.

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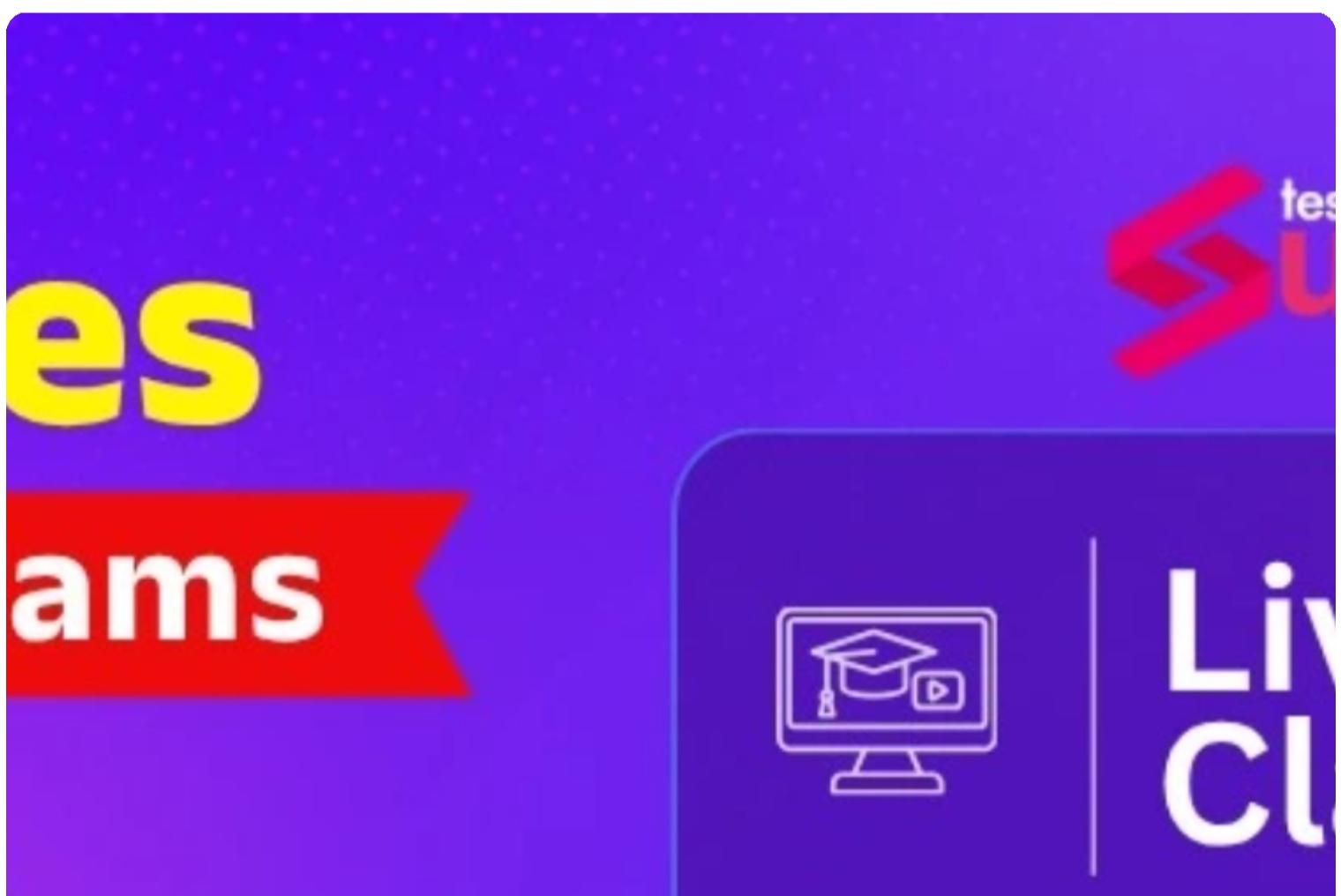
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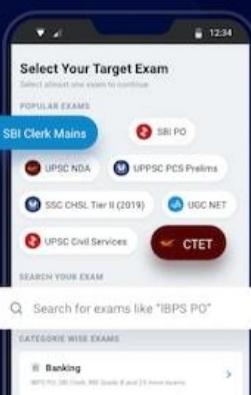


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There are different categories in which various networks can be classified, according to their size, capabilities, and the geographical distance they cover. A network is normally a group of multiple computer systems linked together in some manner so that they can share information and data between them.

Various kinds of networks facilitate different services and have different requirements to work properly. Most of the network varieties are known as different types of ‘area’ networks – this is mainly because of the history of networks, and dates back to the time when computer networks were described by their literal scale. This is no longer the situation due to new technology.

Through this article, we will learn about the computer network and their types(LAN, MAN, WAN, and more), with their usages and working.

Read more about [Generations of Computers](#), here.

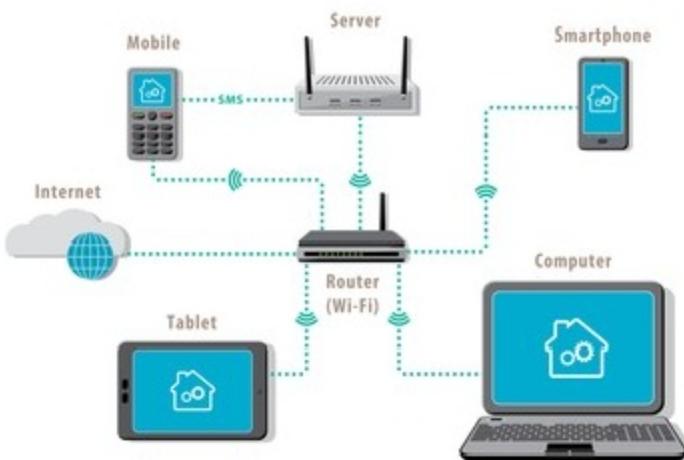
## Different Types of Computer Networks

A computer network can be defined as a group of computers that utilize a set of common communication protocols over digital interconnections to share resources over the network. A network can be a small one including a handful of systems to a one with millions of devices spread all across the world.

The various types of networks are listed as below:

### Local Area Network (LAN)

This is one of the original and very basic types of network, and also one of the simplest. LAN networks group computers together over comparatively small distances, such as within a single building or a small group of buildings, schools, offices, colleges, universities, etc to share resources such as printers, file servers, scanners, and the internet.



Often they do not contain more than one subnet and are generally controlled by a single administrator. The communication medium used for LAN is twisted pair, coaxial cable, etc, and is built with less costly or inexpensive hardware such as hubs, network adapters, and ethernet cables.

The data is carried at an extremely accelerated rate in the Local Area Network with added higher security. It principally works on private IP addresses and does not include heavy routing. LAN can be wired, wireless, or in both styles at once.

Learn more about the [Types of Computer Network Devices](#) here.

## Personal Area Network (PAN)

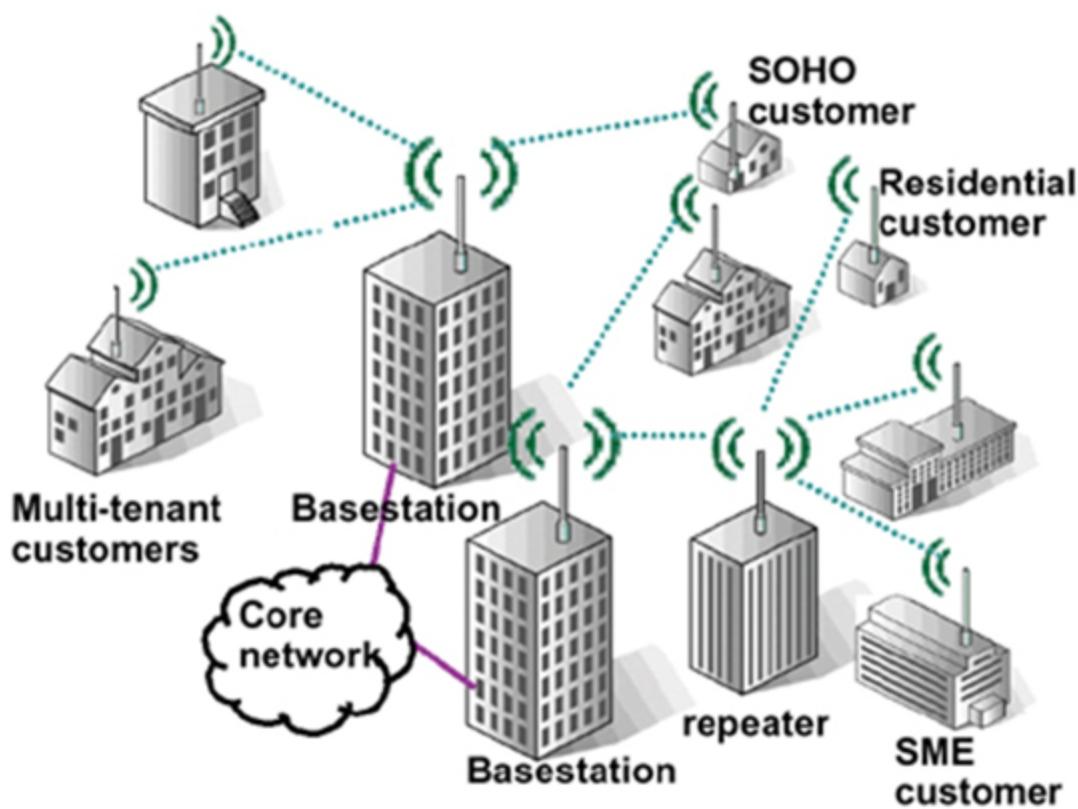
The smallest and most primary type of network, a PAN is composed of a wireless modem, a computer or two, phones, laptops, Bluetooth-enabled devices or infrared-enabled devices, media player, printers, tablets, etc., and revolves around one individual in one building.

This may also incorporate a wireless computer keyboard and mouse, Bluetooth-enabled headphones, wireless printers, and TV remotes. These types of networks are typically observed in small offices or residences and are controlled by one person or organization from a single device.

PAN possesses a connectivity span of up to 10 meters. There are two types of Personal Area Network: Wired Personal Area Network and Wireless Personal Area Network.

## Metropolitan Area Network (MAN)

MAN is a kind of network which is bigger than a LAN but smaller than a WAN and incorporates properties of both. It typically covers a town or city and is controlled by a single person or company, such as a local council or a large company. The most extensively used protocols in MAN are RS-232, ATM, Frame Relay, ISDN, ADSL, OC-3, etc. It has a longer range than Local Area Network(LAN).

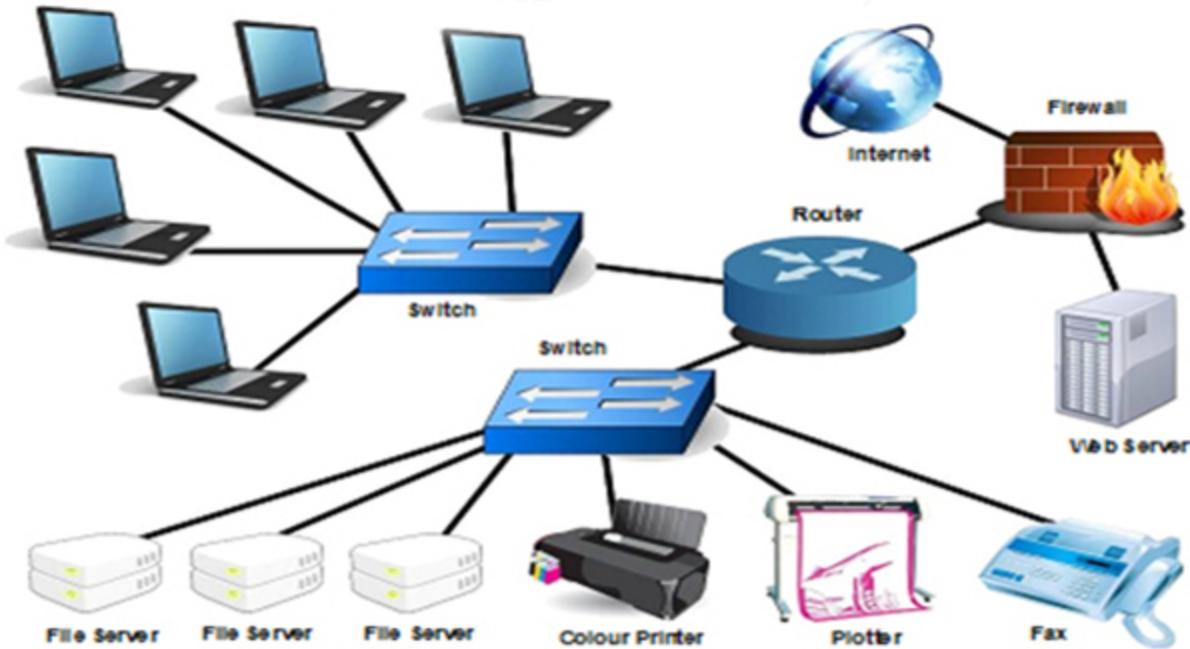


This type of network can be applied to connect citizens with various Organisations for example communication between the banks in a city, employed in college within a city, Government and private organizations use MAN to connect all its offices within the city.

Also, learn about [Types of Computer Network Topology](#) here.

## Wide Area Network (WAN)

This is another kind of the original category of network and is Slightly more complex than a LAN. WAN networks encapsulate computers together over huge physical distances, remotely connecting them over a network and allowing them to communicate even when far apart.



The Internet is an example of WAN which connects computers all around the world together. WANs are generally too large to be controlled by one administrator, and so generally have collective ownership, or in the case of the internet, is publicly owned. WAN is a general connection between LANs and MANs, that is not restricted to a single location, but it traverses over a large geographical area through a telephone line, fibre optic cable, microwaves, or satellite links.

A Wide Area Network is extensively applied in the field of business, government, and education. The data communication is slowest in WAN due to the largest distance. The installation cost of WAN is very high and utilizes advanced technologies such as Asynchronous Transfer Mode (ATM), Frame Relay, and Synchronous Optical Network (SONET).



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**Other Types of Network**

## Other Types of Network

There are also other types of network users may encounter. Some of these are distinct, but most are developed from LAN and WAN networks to have slight variation and adapt to different user needs. These include:

### Campus Area Network (CAN)

This is a network that is bigger as compared to a LAN, but smaller than a MAN. This is very common in areas like a university, large school, or small business. CAN spread over several buildings which are reasonably local to each other. It can have an internal Ethernet along with the capability of connecting to the internet. Its also referred to as a “Corporate Area Network”.

Know more about the [Computer Virus](#) here.

### Wireless Local Area Network (WLAN)

This is a LAN that is implemented with the use of wireless network technology such as Wi-Fi. This kind of network is becoming more popular these days as wireless technology is further developed and is used commonly in the home and small businesses. In other words, devices do not need to be dependent on physical cables and wires as much and can organize their spaces more effectively.

### System Area Network (SAN)

System area network combines computers on an especially high-speed connection, in a configuration known as a cluster(server-to-server applications). It means computers that are linked in a group to work as a single system, and can be implemented as a result of very high-speed computers and new low-cost microprocessors. They are generally used to enhance performance and for cost-effectiveness.

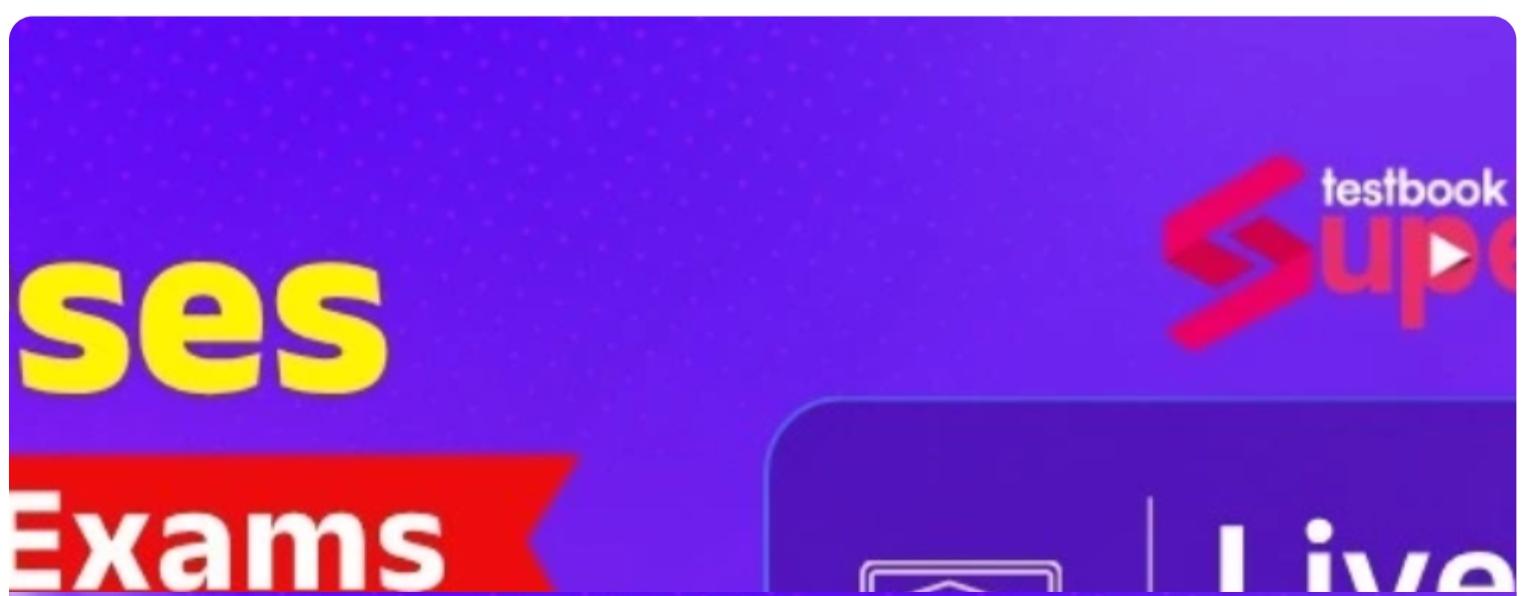
### Storage Area Network (SAN)

This network links servers directly to devices which store large amounts of data without depending on a LAN or WAN network to do so. This can include another type of connection known as Fibre Channel, a structure similar to Ethernet which manages high-performance disk storage for applications on a variety of professional networks. Types of storage-area networks include virtual, converged, and unified SANs.

### Virtual Private Network (VPN)

A Virtual Private Network or VPN is a private network that lets its users transmit and accept data as if their devices were connected to the private network and even if they are not. These systems use encryptions and other security tools to guarantee authorized user's access. Through a virtual point-to-point link, users can enter a private network remotely.

Learn about the various [Computer Shortcut Keys](#) here.



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## Modes of Communication in Computer Networking

Transmission mode or communication mode serves as a medium of transferring data between two devices. There are mainly three types of transmission/ communication mode- simplex, half-duplex, and full-duplex. Let us understand each of them briefly;

### Simplex mode

The mode of communication is unidirectional in Simplex mode. This implies data can flow in one direction only i.e either a device can send data or receive data at a single instance but cannot perform both operations.

Keyboard and Monitor are examples of the simplex mode. A keyboard can only receive the data from the user on the other hand a monitor can only be utilized to display the data or information on the screen. In simplex mode, the full capacity of the communication channel can be applied during transmission.

Learn more about [Input and Output Devices](#), here.

### Half-Duplex mode

In half-duplex mode, each channel can transmit and receive data, but not at the same time. When one device is transmitting data, the other can only receive the data, and vice versa. The half-duplex mode is used in cases where there is no requirement for communication in both directions at a particular instant. The complete potential of the channel can be utilized for each direction. A Walkie-talkie is an illustration of the Half-duplex mode.

### Full-Duplex mode

## Full-Duplex mode

In a full-duplex communication mode, the communication between sender and receiver can take place simultaneously. That is a sender and receiver can both send and receive data at the same time. The full-duplex transmission mode is like a two-way road, in which traffic can move in both directions at the same point. A telephonic conversation between two individuals is a type of full-duplex communication. The Full-duplex mode is the most active mode of communication between devices.

We hope that the above Computer Network article is helpful for your exam preparations. Stay tuned to the [Testbook app](#) for more updates on similar topics from Computer Awareness, and numerous such subjects. Also, access the test series available to test your knowledge regarding various exams.

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A computer virus is a malicious program that is transmitted into the user's computer without the user's knowledge. It replicates itself and affects the files and programs on the user's PC. The actual intention of a virus is to make sure that the victim's computer will never be able to work properly or even at all. These computer viruses are present in multiple types and all of them can infect the devices differently.

Through this article, we shall review in detail what is a computer virus and what are its different types, followed by the Anti-virus and how it protects the computer through the virus.

Read more about the [Difference Between WWW and Internet](#), here.

## Computer Virus: Definition

A computer virus is a piece of code that gets implanted in a program and is constructed with the ability to self-replicate; affecting other programs on a computer. It's just like how humans get a cold or flu, it can remain dormant within the system and get activated when you least expect it.

A virus has the potential to cause unexpected damage to the system, such as harming the system software by corrupting or destroying data.

A computer virus is formed to diffuse from one host to another and thus there are numerous ways how the user's computer catches it. It can be through email attachments, downloaded files, during software installations, or using unsecured links. These viruses can steal the user's data such as passwords, hack into their social media accounts or online banking accounts, and also wipe out all the saved data.

When a virus program is executed, it replicates itself by changing other computer programs and rather enters its coding. This code infects a file or program and if it grows massively, it may ultimately result in the crashing of the device. Certain indications can help you analyze that a device is virus-hit. Given below are some of them:

1. In case a virus is fully executed into a user's device, the time needed to open any application may become longer and the entire system processing becomes slower.
2. Started getting too many pops up on the window or screen while working, this is also an indication of a virus attack on the system.
3. Files or applications may begin to open by themselves in the background of the system without the user's knowledge.
4. In case of a virus attack, the possibility of accounts getting hacked increases and even the user might get logged out of all the systems and applications.
5. In most cases, if the virus grows at maximum then changes can be seen in the files and programs, and this may even lead to a system crash.

Learn about the [Computer Network](#) here.



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## Computer Virus: Names and Definitions

Explained below are the various types of computer viruses:

### Boot Sector Virus

It is a kind of virus that affects the boot sector. This type of virus enters the system when computers are booted from floppy disks. Nowadays, these viruses can even penetrate in forms of physical media such as external hard drives or USBs.

The Boot sector includes all the files which are needed to start the Operating system of the computer. The virus either overwrites the existing program or replicates itself to another part of the disk.

### Direct Action Virus

When a virus connects itself directly to a .exe or .com file and penetrates the device while its execution is named a Direct Action Virus. It is also known as a Non-Resident Virus as it does not install itself.

These viruses are active only when the user executes the file containing the virus, otherwise, it remains dormant. The main objective of this type of virus is to replicate and infect files inside the folder.

Also, learn about [Types of Computer Network Topology](#) here.

### Resident Virus

Unlike Direct Action Virus this type of virus installs itself in the primary memory of the computer and then infects other files and programs. A resident virus can affect anytime when an operating system loads; heading towards file and program corruption. These viruses are hidden in the memory and are hard to find and removed from the system.

### Multipartite Virus

This variety of viruses are very infectious and can infect and spread in various ways. It can infect multiple parts of the system including program files, memory files, and boot sector. If a multipartite virus hits your system, then you are at risk of cyber threat.

## Overwrite Virus

One of the most damaging viruses, the overwrite virus can fully remove the existing program and substitute it with the malicious code by overwriting it. These types of viruses generally spread through emails and are difficult to trace, to remove the virus one needs to delete the infected file.

## Polymorphic Virus

A polymorphic virus is difficult to track or remove as these viruses alter their code each time an infected file is executed. Spread through spam and infected websites.

Learn more about the [Types of Computer Network Devices](#) here.

## File Infector Virus

As the name hints, it first infects a single file and then later grows itself to other executable files and programs. The main cause of this virus are games and word processors. It is also named a parasitic virus which typically affects files with .exe or .com extensions. This type of virus generally slows down the performance of the program followed by many other damages.

## Spacefiller Virus

As the name implies, this type of virus fills in the empty spaces of a file with viruses without affecting the size of the file such that the user cannot detect it easily. It is also recognized as a “cavity virus”.

## Macro Virus

Macro viruses are composed in the same macro language adopted for software applications. These viruses are normally stored as part of a document and can spread when the files are transferred to other computers, often through email attachments.

Read more about [Types of Computers](#), here.

## Browser hijacker

This type of virus targets and modifies the user's browser settings. It is often termed a “browser redirect virus” as it redirects the user's browser to other malicious websites. This virus can also lead to shifting the default home page of the browser.

## Web Scripting Virus

This type of virus utilizes the code of web browsers and web pages. If the user enters such a web page, the virus can contaminate their computer. Web scripting viruses can steal user's cookies and use the data to post on the user's behalf on the infected website.



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## What is an Anti-Virus?

Antivirus software is a usually available and extensively used program or set of programs that are outlined to restrict, search for, detect, and remove software viruses, and other malicious software like worms, Trojans, adware, and more.

## Why Do We Need Antivirus Software?

These tools are crucial for users to have loaded and up-to-date because a computer in the absence of antivirus software protection will be infected within minutes of connecting to the internet.

The bombardment is constant, which implies antivirus companies have to update their detection tools periodically to tackle the more than 60,000 new pieces of malware created every day.

Today's malware (an umbrella term that encapsulates computer viruses) alters appearance suddenly to prevent detection by older definition-based antivirus programs. Viruses can be designed to cause damage to the device, prohibit a user from accessing data, or take control of the computer.

Learn about the various [Computer Shortcut Keys](#) here.

## What Does Antivirus Software Do?

Various companies create antivirus software and what every one of them offers can be different but all perform the following essential functions:

1. Scan particular files or directories for any malware or predetermined malicious patterns.
2. Allow users to plan scans to automatically run for the user.
3. Allow users to conduct a scan of a selected file or the entire computer, or of a CD or flash drive at any time.
4. Quarantine any malicious piece of program detected, sometimes the user will be notified of such infection and asked if he/she wants to dump the file, other programs will automatically do this in the background.
5. Reminds about the ‘health’ of the computer.
6. Always be sure the user has the best, up-to-date security software installed to protect his/her devices like computers, laptops, tablets, and smartphones.

## How Does Antivirus Software Work?

Most of the antivirus software programs still download malware definitions straight to the user’s device and scan the files in search of any possible matches.

But since, as it’s mentioned above, most malware periodically morphs in appearance to avoid being caught, Webroot works differently. Rather than storing examples of recognized malware on the device, it saves malware definitions in cloud storage. This enables us to acquire less space, scan quicker, and manage a more robust threat library. Some of the examples of antivirus are Norton(for Android and Windows), McAfee( iOS and Mac), Vipre, Avast, and Kaspersky.

We hope that the above topic on Computer Virus is helpful for your exam preparations. Stay tuned to the [Testbook app](#) for more updates on similar topics from Computer Awareness, and numerous such subjects. Also, access the test series available to test your knowledge regarding various exams.

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What is Windows? Windows is an operating system invented by Microsoft. What is an operating system? An operating system is what enables us to use a computer. Windows appears preloaded on most latest personal computers, making it the most popular operating system across the world.

In general, a window can be defined as a fundamental part of a computer GUI (Graphical User Interface). Windows is used in many offices as it provides access to tools like calendars, word processors, spreadsheets, and many more.

From the examination point of view, the government exams which incorporate computer awareness as a part of their syllabus, it is necessary for the aspirants to have a good command of basics like MS Windows.

Through this article, learn about Windows followed by the various versions, windows operating system, its applications, usages, and more.

Also, learn about [Microsoft Office](#) here.

## Introduction to MS-Windows

In general, this can be said that Windows makes it possible to perform all types of everyday assignments on our computer starting from browsing the Internet, monitoring email, editing digital photos, listening to music, playing games, and much more.

### Editions of Windows

Windows was released for both home computing and professional work. That is each version of Windows editions has the same core operating system, but some editions have added features, at an extra cost. There are two most common editions of Windows; Windows Home and Windows Professional.

#### Windows Home

Windows Home as identified from the name is a basic edition of Windows that offers all the primary functions of Windows, such as scanning the web, playing video games, watching videos, connecting to the internet, working on office software, etc. Moreover, it is less costly and arrives pre-installed with many new computers.

Know more about the [Different Versions of Windows](#) here.

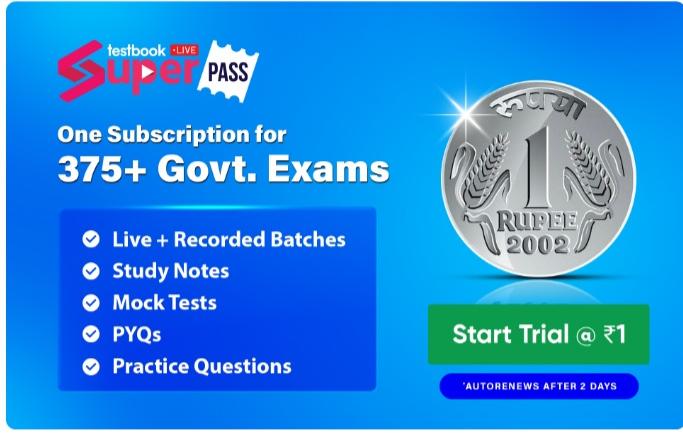
#### Windows Professional

Windows Professional is also identified as Window Pro/Win Pro. It serves as an enhanced edition of Windows, which is helpful for power users and small to medium-size companies. It constitutes all traits of Windows Home along with additional features like:

- **Remote Desktop**, allows users to remotely manage another Windows computer connected to the Internet including sharing the control of its mouse, keyboard, and view display.
- One can also use the TeamViewer or VNC application to generate a remote desktop link.
- **Bitlocker**, allows an integrated file encryption facility via AES (Advanced Encryption Standard) algorithm. Most business laptops/computers use the feature of Bitlocker to guard their data on the computer.
- As if an individual computer has been stolen and the BitLocker feature is active then it is very difficult to break the Bitlocker password.
- It can only be unlocked by inserting the correct password. Additionally, if one forgets the Bitlocker password, it cannot be retrieved again.
- **Hyper-V**, which stands for a hypervisor, is a Windows hypervisor for administering virtual machines that is equivalent to third-party software, such as VirtualBox. It is also termed Windows Server Virtualization.
- **Windows Sandbox**, a sandbox is positioned on a computer, network, or online service that enables users to verify/test computer security without interrupting the system.

- This implies one can use this isolated “Windows within Windows” environment to securely run suspicious or untrusted software. Windows Sandbox demands a Windows Insider build of Windows 10 Pro or Enterprise.
- There are other features like the **Trusted Boot** which provides security such as encrypting to the boot loader and shields the computer from **rootkits**, the **Group policy management** where administrators can specify or define group policies, for handling various Windows users in a business or organization. It provides support for systems possessing more than 128 GB of RAM.
- Also offers more Windows Update installation options, including more adaptable scheduling and postponement for up to 34-35 days.

Know more about the [Generations of Computers](#) here.



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## Versions of Windows: The Timeline

### **Windows 1.0**

Release Date-It was released on November 20, 1985.

### **Windows 2.0**

Release Date-It was released on December 9, 1987.

### **Windows 3.0**

Release Date-It was launched by Microsoft on 22 May 1990.

### **Window 95**

Release Date-It was released on 15 August 1995.

Read more about [MS Excel](#), here.

### **Windows 98**

Release Date-It was released to production on May 15, 1998.

## **Windows 2000**

Release Date-On 17 February 2000, it was launched.

## **Windows XP**

Release Date-It was introduced on 25 October 2001.

You might also be interested in reading more [MS Word](#).

## **Windows Vista**

Release Date-Released to the public on January 30, 2007.

## **Windows 7**

Release Date-It was formally published by Microsoft to the public on October 22, 2009.

## **Windows 8**

Release Date-It was launched by Microsoft on 26 October 2012.

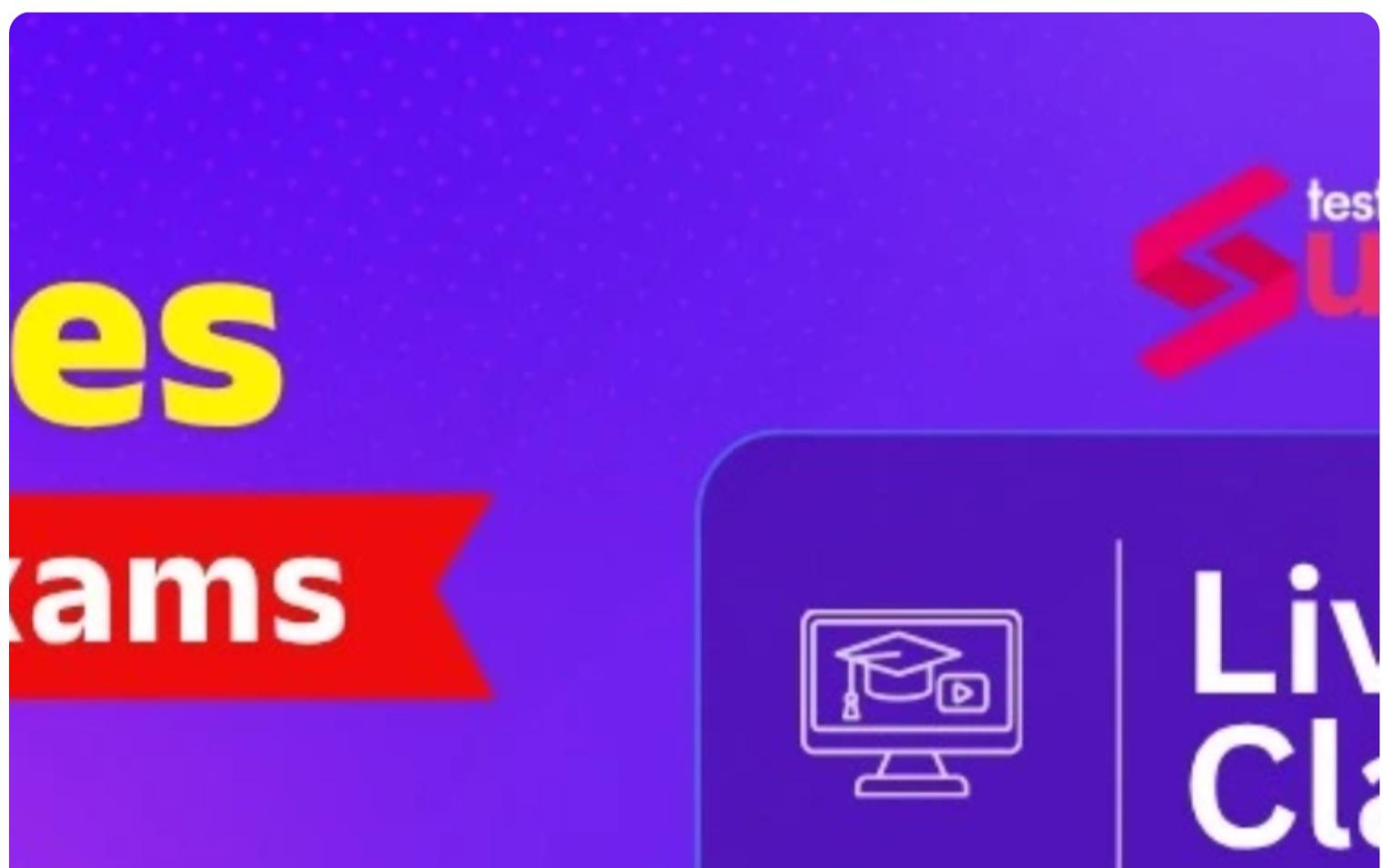
## **Windows 10**

Release Date-On 29 July 2015, Microsoft introduced Windows 10.

We will learn about the various features and other related concepts to the versions of Windows in the coming articles.

Also, check out [MS Access](#), notes here.

We hope the above article on Microsoft Windows is useful for candidates looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.



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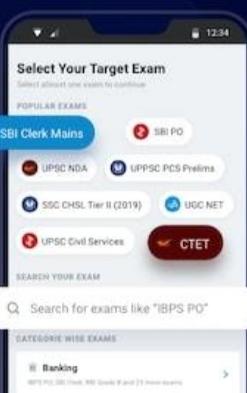


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Windows acts as a graphical operating system designed by Microsoft which allows users to view and store files, run the software, play games, watch videos, and also provides a way to connect to the internet. The window can be moved, dropped, resized, or maximized as desired by the user.

Microsoft issued the first version of Windows in the mid-1980s. So far there have been multiple versions of Windows, but the latest version of MS windows includes Windows 10, Windows, Windows 7, Windows Vista, and Windows XP. Let us learn the features of various versions of the Windows Operating System individually; starting with the oldest one.

## Versions of Windows

### Versions of Windows- Windows 1.0

#### Release Date

It was released on November 20, 1985.

#### Features

- It was the first attempt by Microsoft to design a graphical user interface(GUI) in 16-bit.
- It comprises Simple Graphics.
- Limited multitasking was offered and expected to have a more reliable future potential.
- Various versions like 1.02, 1.03, and 1.04 were also released.

Learn about the [Types of Computers](#) here.

### Versions of Windows- Windows 2.0

#### Release Date

It was released on December 9, 1987.

#### Features

- 16-bit Graphic User Interface (GUI) based working environment.
- The first version of Microsoft Word and Excel were practised for the first time on Windows 2.
- The control panel feature where various system settings and configuration choices were available in one place.
- Unlike Windows 1.0, it came with additional features such as; it allows applications to overlap each other.
- Versions like 2.10 and 2.11 were also released.

### Versions of Windows- Windows 3.0

#### Release Date

It was launched by Microsoft on 22 May 1990.

#### Features

- It was the first Windows that required a hard drive.
- It uses 8086 microprocessors.
- It was the first version of Windows to find significant appreciation.
- It was also capable of executing the MS-DOS program in Windows that supported multitasking in programs.
- It possesses both, conventional and expandable memory.

- Further versions like 3.1 and 3.2 were launched.

## Versions of Windows- Window 95

### Release Date

It was released on 15 August 1995[August 24, 1995 (Availability)].

### Features

- It came as the first complete Operating System.
- Windows 95 offered a completely distinct environment with its new Start button and Start menu features.
- Advanced from 16 bit GUI to 32 bit GUI with multitasking, and taskbar features.
- It blended MS-DOS and Windows products.
- Internet Explorer for the first time was used on Windows 95, but it could not be installed by default. Later, Windows 95 improved and incorporated the IE browser by default.
- On December 31, 2001, Windows declared Windows 95, Windows 3, Windows 2, and Windows 1 versions of OS outdated and discontinued their support.
- It includes features like Device Manager to help list and control computer hardware, improved memory handling capacity, mouse right-click feature, and more.
- It simplified plug-and-play features that enable hardware devices to be automatically installed into the computer with the proper software and does not demand jumpers.

Know more about the [Generations of Computers](#) here.

## Versions of Windows- Windows 98

### Release Date

It was released to production on May 15, 1998.

### Features

- Windows 98 was not a completely new version but just a developed/upgrade version of Windows 95.
- It was released, with features like Internet Explorer 4.0, Windows Address Book, Outlook Express, Microsoft Chat, and NetShow Player.
- The second version of Windows 98 was launched on 5 May 1999.
- In the second version of Windows 98, NetShow Player was replaced by Windows Media Player.
- The Extended support of Windows 98 closed on July 11, 2006.
- Windows 98 combines additional security for important files on the computer such as backing up the registry automatically.
- Improved support for new devices and technologies such as ACPI(Advanced Configuration and Power Interface), AGP(accelerated graphics port), IEEE 1394(FireWire), DVD(digital versatile disc or digital video disc), USB(universal serial bus), and MMX(MultiMedia eXtension).
- It was a 16 bit and 32-bit product based on MS-DOS.

## Versions of Windows- Windows 2000

### Release Date

On 17 February 2000, it was launched.

### Features

- It was officially issued on February 17, 2000, though its construction was started in late 1999.
- Windows 2000 is based on the Windows NT kernel and is also referred to as Windows NT 5.0.
- A core set of features was developed for manufacturing Windows 2000 but in four different editions, targeting varied sectors.
- These incorporated; Server, Professional, Advanced Server, and Datacenter Server.
- It was acknowledged as one of the most secure OS ever.

- Multilingual User Interface which supported various languages.
- Multilingual version enables for User Interface and aids to switch, based on login.
- The automatic updating characteristic made its presence for the first time on Windows 2000, and it was the first operating system to support hibernation.
- Windows 2000 later provided the base for Windows XP also.
- Extended support closed on July 13, 2010.

## Versions of Windows- Windows XP

### Release Date

It was introduced on 25 October 2001.

### Features

- While the construction started on August 24, 2001, the official product was issued on October 25, 2001.
- Windows eXPerience is often abbreviated as XP, Moreover [Microsoft Windows](#) XP was code-named Whistler.
- The 64-bit version of Windows XP was launched on 28 March 2003 and the Professional x64 version was launched on 24 April 2005.
- The two primary versions of Windows XP are; Windows XP Home Edition(Full or upgrade and only 32-bit.) and Windows XP(Full or upgrade and 32-bit or 64-bit) Professional.
- Windows XP was thought the best edition of Windows, it followed Windows ME and gave consumer-friendly elements.
- New interface and multilingual support increased reliability compared to earlier versions of Microsoft Windows.
- High-speed start-up.
- More conventional Graphical User Interface (GUI).
- Extended support ended on April 8, 2014.

## Versions of Windows- Windows Vista

### Release Date

Released to the public on January 30, 2007.

### Features

- Windows Vista is recognized as the successor to Windows XP in Microsoft's Windows.
- It had an upgraded version of Graphical User Interface or can say a completely new GUI unlike any previous version of Windows.
- Windows Vista was codenamed as "Longhorn."
- Windows Media Player 11 and Internet Explorer 7 made their presence for the first time on Windows Vista, combined with Windows Defender, an anti-spyware program.
- It was the first operating system to practice DVD-ROM for installation.
- Windows Vista also gave some helpful features such as Windows DVD Maker, speech recognition, and Photo Gallery.
- Extended support expired on April 11, 2017.

## Versions of Windows- Windows 7

### Release Date

It was formally published by Microsoft to the public on October 22, 2009.

### Features

- It was introduced to overcome all difficulties that were faced by Windows Vista.
- It was more stable, faster, and easy to use as compared to the earlier versions.
- Faster start-up time.
- Extended hardware assistance.

- It was issued with user-friendly features and less dialogue box overload.
- It supports multi-touch screen displays.
- Extended support ended on January 14, 2020.

## Versions of Windows- Windows 8

### Release Date

It was launched by Microsoft on 26 October 2012.

### Features

- It was featured with new programming and technology that makes it run faster than the previous versions.
- Came installed in new devices such as Laptops, Tablets, Mobile phones, etc.
- It was issued with new features, such as a fast operating system, support for the USB 3.0 devices, and Web store.
- Internet Explorer 10 was included.
- The Web store in Windows 8 is a place from where one can download several types of Windows applications.
- The task manager had been redesigned.
- Windows 8 is convenient to be installed either in 32-bit or 64-bit.
- New security features were included.
- Windows 8.1 was launched on October 17, 2013. It was relaunched with the start button on the desktop that initiates the Start Screen.

Also, learn about [Microsoft Office](#) here.

## Versions of Windows- Windows 10

### Release Date

On 29 July 2015, Microsoft introduced Windows 10.

### Features

- Windows 10 is the latest version of Microsoft Windows.
- It was planned for all Windows platforms across various devices, as well as Windows tablets and Phones, including common applications.
- Along with Internet Explorer, a new Microsoft Edge browser for Windows 10 users, was also included.
- Addresses faults in the user interface initially introduced in Windows 8.
- Cortana; the new voice assistant was also added to the Windows search bar.
- It is provided with a virtual desktop system.

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## More Features of Windows

### Control Panel

The control panel of windows allows the user to configure and manage the resources on their computer. For example, one can change settings for video, audio, printers, keyboard, mouse, network connections, power-saving options, installed applications, date and time, user accounts, and much more.

### File Explorer

File Explorer is also identified as Windows Explorer, where all the files and folders on the computer are displayed. It allows the users to search for the inserted removable disks like pen drives and CDs, survey for the data on the hard drive, and SSD. Moreover, the content stored in the drives can be renamed, deleted, searched, or even transferred.

### Microsoft Paint

It is easy software to view, create, or edit an image. It allows several tools to edit or draw images like resize, crop, and save an image with a distinct file extension.

### Taskbar

Windows are installed with a taskbar that illustrates currently opened programs/tabs, it also enables users to access any particular programs. Additionally, there is a notification area on the right side that shows volume, battery, date and time, network, and other background running applications.

### Start Menu

The start menu of Microsoft Windows is present on the left side of the taskbar which displays programs and services that are installed on the computer.

## Internet browser

The internet browser assists the users to search for anything, view pages, watch videos, do online shopping, play games, etc.

We hope the above article on Different Versions of Windows is useful for candidates looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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**What is MS Office?** Microsoft Office or MS Office can be seen as a form of a collection of an array of office-related applications. Each of these Office-related applications has been created by the team of developers at Microsoft to cater to different uses. Microsoft in 2019 launched the latest version of its cloud-based computing platform of MS Office called Microsoft 365.

The first suite of MS Office containing various applications was launched in the year 1988, and since then different versions and a total of 16 suites have been released by Microsoft the latest being the MS Office 19 which is for offline use unlike Microsoft 365 which is for online use.

## Introduction to MS Office

Microsoft Office is a closed-source software office suite containing different applications. It was first launched by Bill Gates on 19th November 1990 soon after the launch of Microsoft Windows.

The first version of MS Office Contained MS Word, MS Excel & MS PowerPoint. While these are called Applications, Microsoft Office is called Software.

The list of Applications launched by MS Office are as follows:

- MS Word- First launched in 1983.
- Main Function-Creating text files.
- MS Excel-First launched in 1985.
- Main Function-Creating Spreadsheets.
- MS PowerPoint-First launched in 1987.
- Main Function-Creating Presentations.
- MS Access- First launched in 1992.
- Main Function-Database Management.
- MS Outlook-First launched in 1997.
- Main Function-Emailing & Work Calendar.
- MS OneNote-First launched in 2003.
- Main Function-Keeping Notes.
- MS Publisher-First launched in 1991.
- Main Function-Desktop Publishing.
- Skype-First launched in 2003.
- Main Function-Video Conferencing.

Out of these applications, MS Word, MS Excel & MS PowerPoint are used the most across the world.

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## MS Office Applications and their Features

### MS Office -MS Word

Microsoft Word is the most convenient software used for creating text files. These text files can be edited and transferred from the author to others and edited by them too. As a word processing application, there are the following functions available:

- “.doc” is the extension for Doc files.
- It helps generate text documents.
- Features like colors, work art, images, animations can be inserted along with the text in the same file.
- Authors or Writers can use it for writing/ editing reports, letters, documents, resumes, and more.
- Spell-checks facility on the writing doc file is also available.

Read more about [MS Word](#), here.

### MS Office-MS Excel

MS Excel is used for processing the data that is in tabular form and then performing mathematical functions on it to analyze it. MS Excel performs the following basic functions:

- MS Excel is majorly utilized for making spreadsheets.
- In MS Excel, there are rows and columns. The intersection of rows and columns forms a cell.
- The unique functions that [MS Excel](#) has are Formulas & Data. Users can perform the formula on data to analyze it quickly; which can be easily managed and can be applied as a replacement for paper.
- Right from basic functions like addition & subtraction, the user can perform complex statistical functions like correlation & t-test.
- File extension, for MS Excel, is “.xls”
- MS Excel is a data processing application where large data can be easily managed and saved in tabular format.

### MS Office -MS PowerPoint

- MS PowerPoint is an application that provides the user to work with slides and runs a slideshow.
- PowerPoint mainly comprises slides for making the presentation.
- One can decide the sequence of the slide, layout, design, add media to the slides & can also perform other word processing functions like font change, size change, etc.
- “.ppt” is the extension for PowerPoint presentations.
- Generally, used to generate audiovisual presentations.

Explore more about [MS PowerPoint](#).

## Other Microsoft Functions

### MS Office – Microsoft Outlook

- The MS Outlook application is a Personal Information Manager or in simple words, it is a form of a personal organizer like managing dates, tasks, and others.
- Its primary work is to send and receive emails. Outlook came into existence in the year 1997 and was launched as a part of the Microsoft Office Suite of 1997.
- [MS Outlook](#) is an application one needs to pay for to use while creating an email on outlook is free of cost, and can be used both as a single-user application or multi-user software.
- The Outlook file is saved with the extension “.pst”.
- Its functions also incorporate calendaring, task managing, journal logging, contact managing, and web browsing.

### MS Office – Microsoft Publisher

- Microsoft Publisher is a Desktop Publishing Application and works as an entry-level Graphic Design application.
- Though on the onset it may seem similar to MS Word it has a greater emphasis on Page layout and Design.
- It can be used to create basic templates, cover pages, and logo designs.
- The first version of Microsoft Publisher 1.0 was released in 1991.
- The file extension of files created by using Microsoft Publisher is .pub

### MS Office – Microsoft Access

- Microsoft Access functions as a Database Management System (DBMS).
- It helps users to be able to analyze humongous amounts of information and manage data more efficiently.
- Tables, forms, queries, and reports can be formulated on MS Access.
- The application works through storing information that is related together and creates connections between different things to make a holistic and more easy-to-use database.
- It is an important application used for Data-entry by organizations. The first version of Access was released by Microsoft Corporation on 13th November 1992.
- Several file extensions are depending on the file formats, the most common being the .adn extension.

Read more about [Microsoft Access](#).

### MS Office – Skype

- Skype is one of the most commonly used applications for electronic telecommunication through Video Chats and Voice Calls between Computers, Tablets, Mobiles, and even through devices like Xbox One.
- The application also supports the exchange of messages between the respondents and also can be used for Video conferencing.
- Originally founded in 2003 by Niklas Zennstrom from Sweden and Janus Friis from Denmark.
- It was launched on the 29th of August, 2003 when the first Beta version of Skype went public.

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## Microsoft Office Versions

- Microsoft Office for Windows Version was launched in the year-1990.
- Microsoft Office 3.0 Version was started in- August 30, 1992.
- Microsoft Office 4.0 Version was commenced in the year- 1994.
- Microsoft Office 95 Version was launched in-August 24, 1995.
- Microsoft Office 97 Version was commenced in the year -1997.
- Microsoft Office 2000 Version was launched in-June 7, 1999.
- Microsoft Office XP Version was launched in- May 31, 2001.
- Microsoft Office 2003 Version was launched in- October 21, 2003.
- Microsoft Office 2007 Version was started in-January 30, 2007.
- Microsoft Office 2010 Version was initiated on -June 15, 2010.
- Microsoft Office 2013 Version was inaugurated in-January 29, 2013.
- Microsoft Office 2016 Version was started in- September 22, 2015.
- Microsoft Office 2019 Version was started in- September 24, 2018.

We hope the above article on Microsoft Office is useful for candidates looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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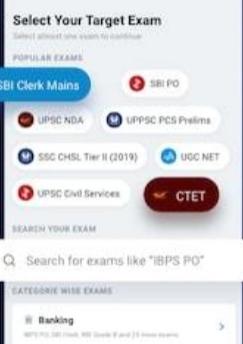
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Microsoft Word is the most suitable software utilized for building text files. These text files can be altered and transferred from the creator to others and edited by them as well.

MS Word developed by Microsoft is one of the most widely used programs of Microsoft Office suite. This article gives an introduction to MS Word, its various features, and its uses in detail.

It is one of the office productivity applications involved in the Microsoft Office suite. Formerly developed by Charles Simonyi and Richard Brodie, software engineers. It was first released in 1983. Any word file is by default saved with the extension “.doc”.

Check out this article on [Microsoft Windows](#) here.

## Introduction to MS Word

What is ms word? Microsoft Word enables us to create professional-quality reports, documents, resumes, and letters. Unlike a plain text editor, Microsoft Word has highlights including grammar check, spell check, image support, text and font formatting, advanced page layout, HTML support, and more.

Follow these simple steps to open MS Word on your individual computer:

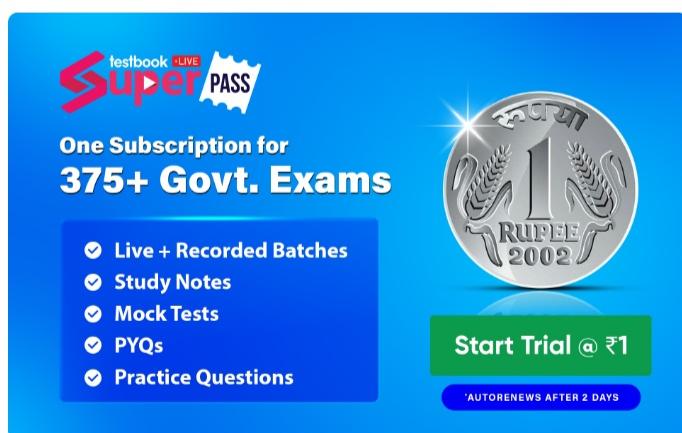
**Click on Start → Go to All Programs → Select MS Office → Then select MS Word.**

One can create MS Word doc by these simple steps:

**Step 1:** Open Microsoft Word with the above step.

**Step 2:** Once the program is open, click on->Microsoft office button(For Windows 7) or File(For Windows 10) succeeded by->” New” and this will open a new doc.

MS Word is utilized by people of every age group, in schools, in colleges, and for official purposes as well, therefore having proper knowledge of Microsoft Word is a necessity.



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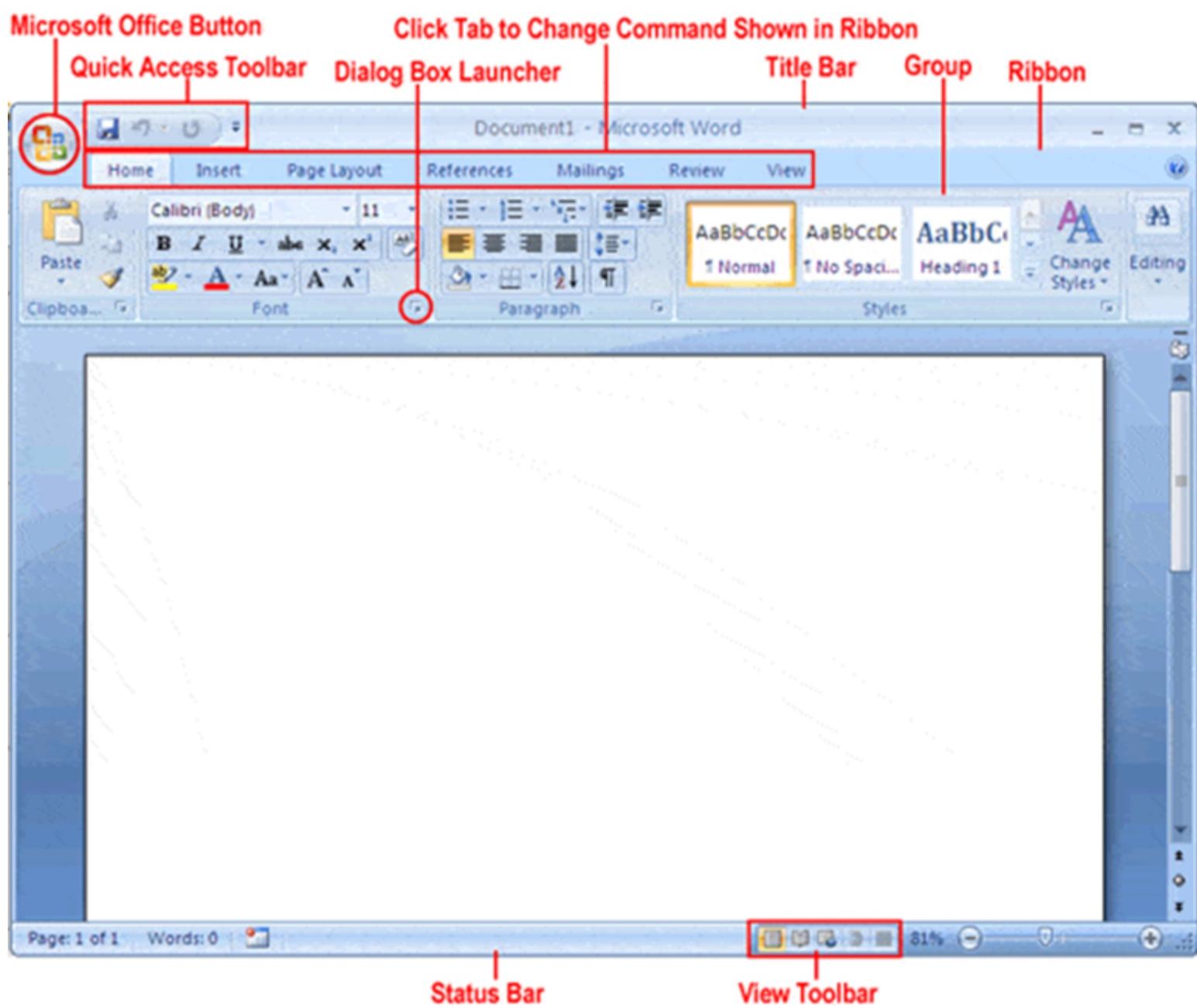
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## Features of Microsoft Word

This is how MS Word window looks like (version 2007):



As a word processing application, there are the following functions available:

To process any instructions on the existing text in Word, first, the user requires to choose the text. To select any text, the user needs to put the cursor before the word and press the Shift + Right arrow. Alternatively, the user can place the cursor after the word ends and press Shift + Left Arrow.

### Home

From the Home menu, the user can copy/cut the existing text & paste it to some other place in the same document or the other document.

The other processes that can be operated from the 'Home' menu are changing fonts, colour, size, case, alignment, spacing, etc.

Bullets, numbers, and paragraphs can also be introduced from the same menu. Users can look for a particular word in the document by clicking on “Find” from the Home menu or simply Pressing “Ctrl + F”. There is an option of replacing that word too.

## Insert

From the ‘Insert’ menu, files apart from the text can be embedded in the document. E.g. screenshots, links & hyperlinks, images, tables, charts, equations, special symbols, shapes, headers, footers & page numbers.

## Design

From the Design menu, users can obtain pre-decided templates of fonts & font sizes for heading, subheading & other text of the document.

That helps improve the readability of the file quickly.

Page layout option provides the user with a chance to change the spacing before the paragraphs, indents, and general margin spacing of the page.

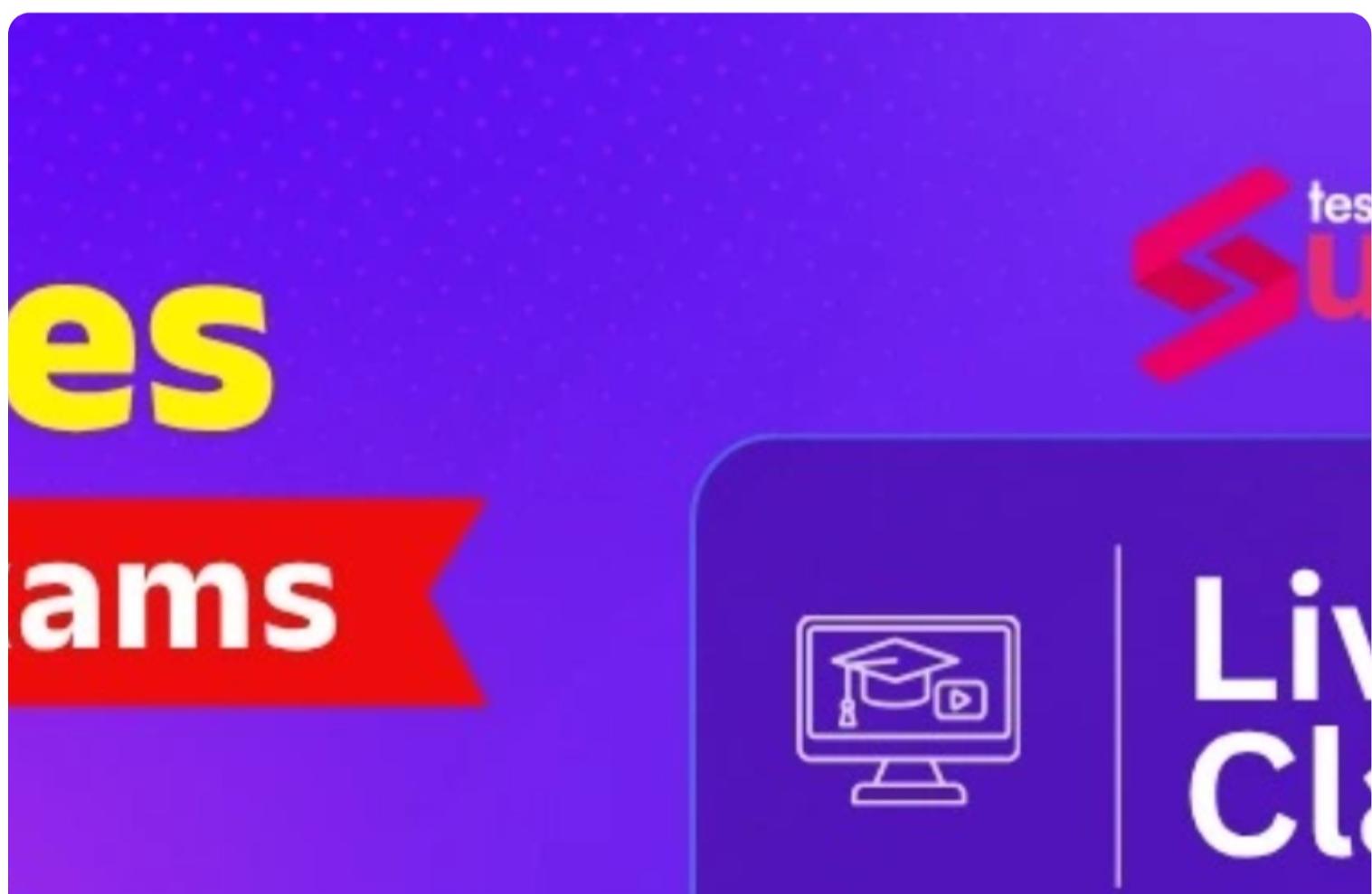
## References

From the References option, the user can include a footnote, table of contents, caption, Bibliography & Citation of the texts in different formats like MLA, APA but for that, the user requires to insert a list of books the user has referred to.

## Review

The review option helps users check spelling & grammar errors in the document & protect the document from being edited by non-trusted users.

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## MS Word Terminologies

1. **Word Wrap-** A feature of the word that moves or advances text to the next line when typing exceeds the right margin without pressing the Enter key.
2. **Drag and Drop-** A smart approach to copy or transfer text a short distance.
3. **Word Art-** Text designed as a graphic image.
4. **Thesaurus-** A feature that provides synonyms or alternative words for chosen words.
5. **Footer-** A feature that allows the text/graphics that are marked on every page or segment, regularly at the bottom yet can be anywhere on a page.
6. **Header-** A feature that allows text/graphics that are imprinted on every page/section, usually at the top yet can be anywhere on a page.
7. **Paragraph Styles-** A feature that allows text styles for complete paragraphs, including their fonts, alignments, tabs, etc.
8. **Endnotes-** Notes or references that resemble at the end of the document.
9. **Footnotes-** Comments or references that appear at the bottom of each page.
10. **Indent-** A feature that allows setting a temporary left or right margin for paragraph lines.
11. **The margin-** The gap between the edge of the text in the record and top, base, or side edges of the page.
12. **Page Break-** The spot in a document where one page ends and the other starts.
13. **Bullets & Numbering-** A feature that enables the user to generate bulleted or numbered paragraphs.
14. **Landscape-** A terminology used to specify page orientation, where the page is wider than it is tall.
15. **Page Orientation-** How pages are laid out in a written document.
16. **Portrait-** A page orientation where the page is longer than it is wide.
17. **Formatting Toolbar-** A feature that enables changing character and paragraph format settings, such as alignment and type styles.

18. **Font Style**- Certain regular changes in the appearance of a font.  
19. **Charts**– Graphs that employ columns, lines and pie shapes to denote numbers and data.

Learn more about [Microsoft Office](#) here.

## Uses of Microsoft Word

1. MS Word allows users to do write-ups, build documents, resumes, records, instruction documents, or a letter to another person and serves as one of the most regularly used programs under the Office suite. Other usages of MS Word are as follows;
2. In the education field, MS Word is regarded as one of the simplest tools which can be utilized by both teachers and students; for formulating notes more easily through MS Word by making them more interactive by adding shapes, images, colours, and other effects.
3. It is also beneficial to make assignments on MS Word and submit them online.
4. In the workplace, MS Word is employed for submitting letters, planning reports, making bills, sample documents, letterheads, etc.
5. MS Word serves as one of the best tools for creating and editing resumes and making changes to them.
6. As separate choices are available for table of contents, bibliography, etc., MS Word acts as the best tool that can be utilized by authors for writing books and adjusting it as per the requirement.

We hope the above article on Microsoft Word is useful for candidates looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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Excel is a spreadsheet application initiated and published by Microsoft. It is a component of the Microsoft Office suite of productivity software. MS Excel is the most commonly used Microsoft Office application. Excel was formerly code-named *Odyssey* through development. It was first published on September 30, 1985. Excel is the spreadsheet program that is employed to save and analyze numerical data.

For example, one can create an Excel spreadsheet that determines a track associated charges, monthly statements, and interactively classify the data by the required criteria.

With this article, we will learn about essential features of MS Excel, accompanying a sketch of how to use the program, its advantages or benefits, and other significant elements.

Learn about [Microsoft Access](#) here.

## About MS Excel

### What is MS Excel?

1. Unlike a word processor, such as Microsoft Word, Excel builds data in columns and rows. An Excel spreadsheet can be interpreted as a collection of columns and rows that create a table. Rows and columns meet in a space termed a cell.
2. Alphabetical letters are normally allocated to columns, and numbers are ordinarily allocated to rows. Each cell can contain a single piece of data, such as a numerical value, text, or formula.
3. The address of a cell is furnished by the letter depicting the column and the number symbolizing a row.
4. Microsoft Excel is beneficial when we want to record, examine and save numeric data.
5. Microsoft Excel is a spreadsheet program applied to record and analyze numerical and statistical data.
6. Microsoft Excel provides several features to perform various operations like mathematical calculations, graph tools, pivot tables, macro programming, etc. It fits with multiple OS like Windows, macOS, Android, and iOS.

Know more about [Microsoft Windows](#) here.

### How to Start MS Excel?

Microsoft Excel is a component of the Microsoft Office suite of programs. Alternatively, one can even download it from the Microsoft website but you will have to purchase the license key. Working on Excel is not different from working with any other Windows program. If you are operating Windows with a GUI like (Windows XP, Vista, and 7) then to begin MS Excel on your computer, follow these steps:

**Click on the Start Menu->Go to All Programs->Click on MS Office-> Lastly choose the MS-Excel option.**

Alternatively, one can also begin it from the start menu(by typing MS Excel in the search option available)if it has been added there. You can open it from the desktop shortcut if you have created one.



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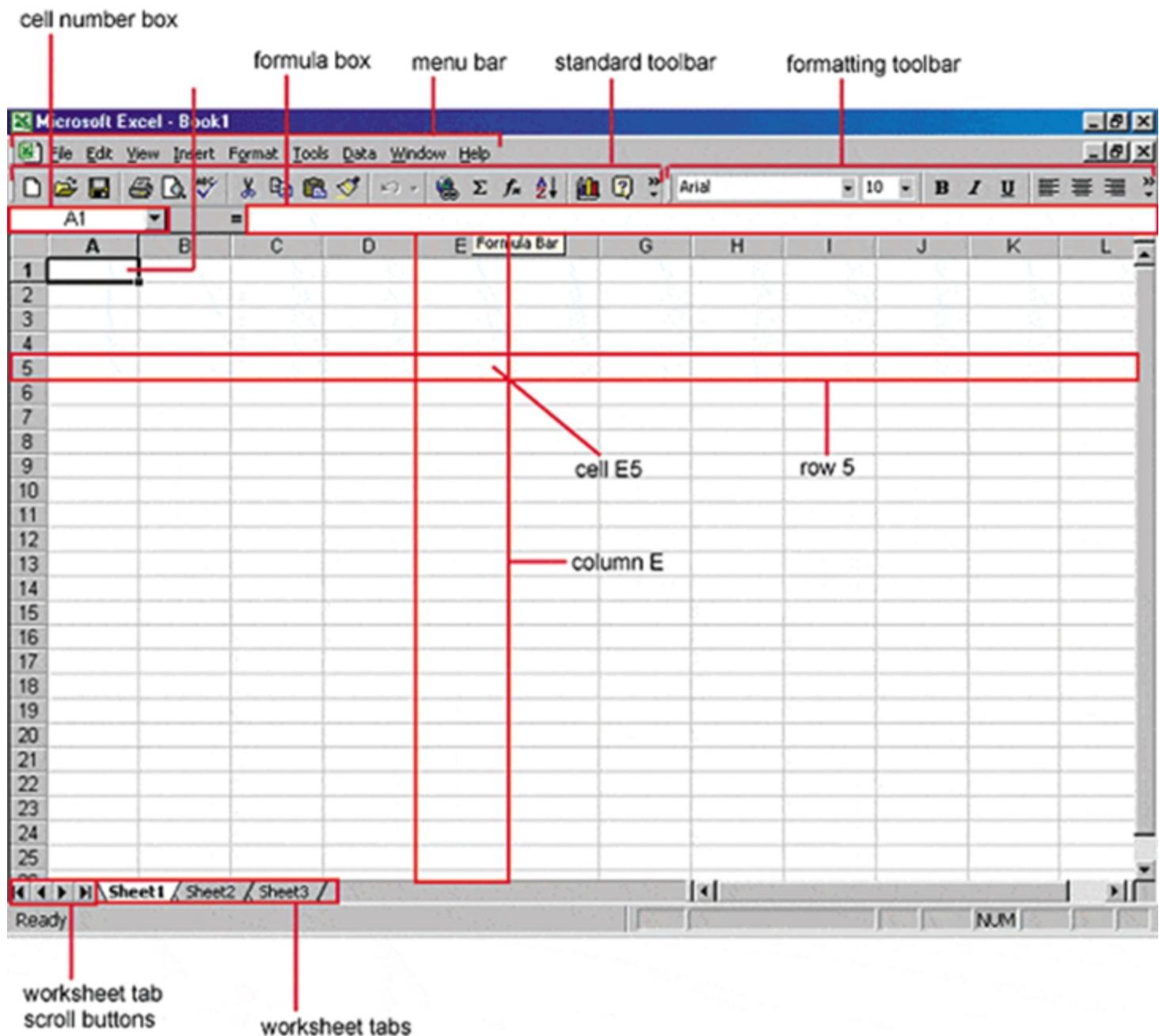
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## Features of MS Excel

MS Excel is used for processing the data that is in tabular form and then performing mathematical functions on it to analyze it. This is what the Excel window looks like (version 2007):



Excel is a tool for coordinating and performing calculations on data. It can examine data, compute statistics, create pivot tables, and express data as a chart or graph. MS Excel performs the following basic functions:

In MS Excel, there are rows and columns. The intersection of rows and columns makes a cell. So each of the cells is an individual unit of data. Each cell has a cell address which is the number of rows and alphabet of the column it appears in. No two cells have the same address ever.

## Home and Insert

The Home & Insert menu of MS Excel is similar to MS Word. Users can change the formatting of the content from home & include pie charts, tables, and other files related to data from the insert menu.

Font size, font color, font styles, alignment, background color, formatting options and styles, insertion, deletion, and editing in the cells options are also available.

One can insert images and figures, header, and footer, charts, and sparklines and even attach graphs, equations, and symbols.

Read more about [MS Word](#), here.

## Formulas

The unique functions that MS Excel has are Formulas & Data. Users can perform the formula on data to analyze it quickly. Users have to select the cells for that and one cell becomes one unit of data.

So if the user selects 10 cells and applies an average formula to them, the user will get an average of the data output of those 10 cells.

To apply a formula to any data, the user needs to select it without any space. Then in the function bar, the user needs to type '=' and the abbreviation of the formula the user wishes to apply.

## Data

From the Data menu, the user can perform functions without changing the original data. Users can filter, add external data from the web & sort data without changing it. For example, the user can sort the data in alphabetical order.

Right from basic functions like addition & subtraction, the user can perform complex statistical functions like correlation & t-test. Moreover, users can convert them into Pie charts or graphs within moments. This makes data analysis easy.

Learn more about [Microsoft Powerpoint](#), here.

## Page Layout

Users can apply themes, orientation, and check the page setup through the page layout option.

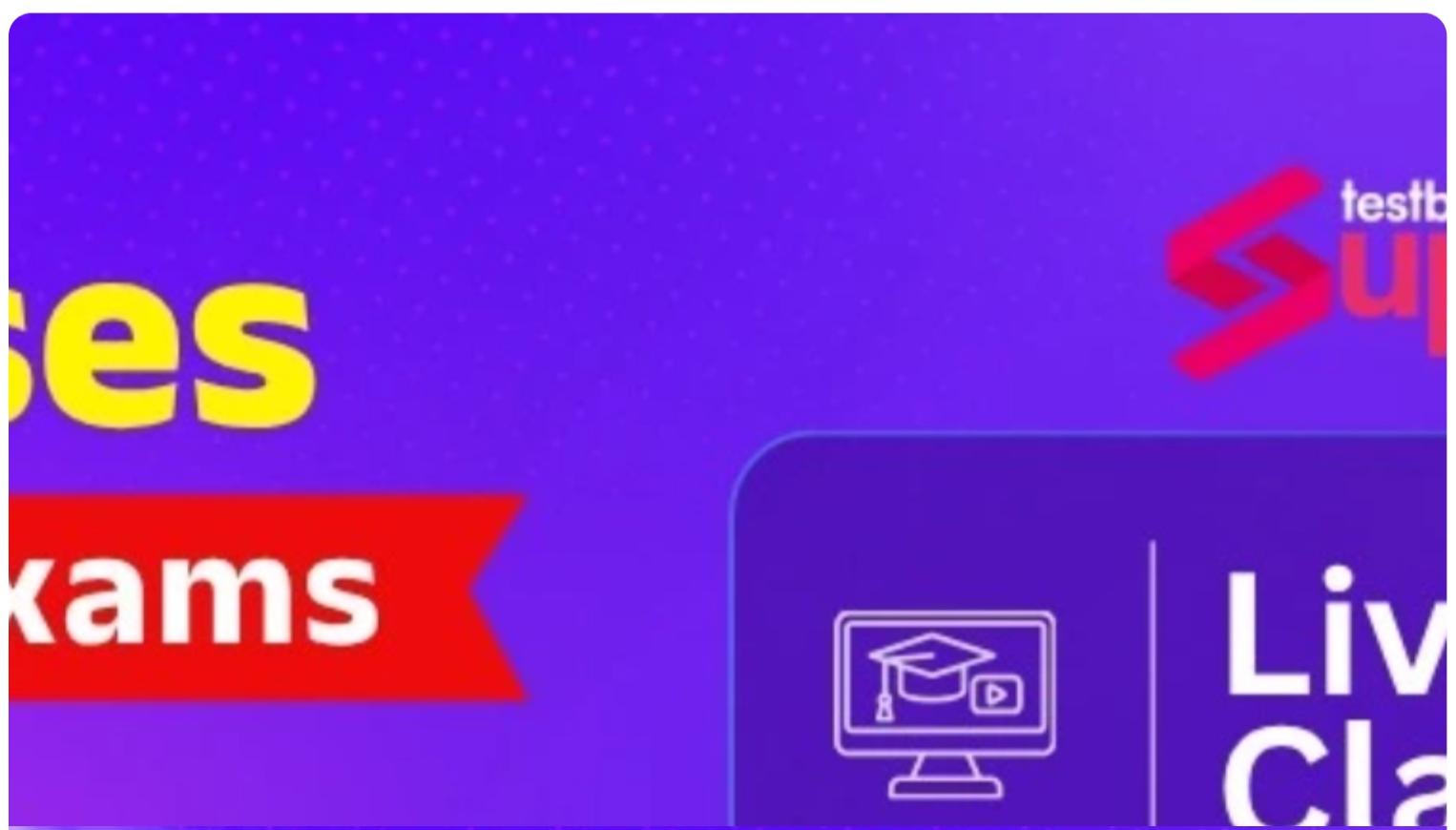
## Review

Proofreading like spell check can be performed for an excel sheet in the review section and a user can even add comments or remarks in this part.

## View

Different views and layouts in which the user wants the spreadsheet to be displayed can be selected here. Options to zoom in and out, full screen, and pane arrangement are available under this section.

Check out [Microsoft office Questions for Bank PO Exam](#) here.



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## MS Excel Terminologies

1. **Cell-** A cell is a rectangle block/box present in a worksheet. Any sort of data that a user wants to enter into the worksheet must be arranged in a cell.
2. Cells can be color-coded, show text, numbers, and the outcomes of calculations, based on the operations. An Active Cell is currently an open-cell for editing.
3. **Workbook-** The workbook relates to an Excel spreadsheet record. It includes all the data that have been listed/sorted/calculated. A workbook that is available to be seen and edited by various users on a network is recognized as a Shared Workbook.
4. **Worksheet-** Inside the workbook is where we get documents called worksheets. Also recognized as spreadsheets, a user can have multiple worksheets in a single workbook.
5. **Workspace-** Very similar to worksheets in a workbook, a workspace enables users to open numerous files simultaneously.
6. **Formula Bar-** The Formula Bar displays the data of an active cell. In the case of formulas, the formula bar will showcase all components of the formula.
7. **Toolbar-** The toolbar that holds quick shortcuts like save, undo and redo, etc.
8. **Chart-** An object that displays data visually / graphically.
9. **Data Validation-** This feature of MS Excel helps to limit incorrect data from being inserted into the worksheet. Data validation aids consistency and precision in the data to be entered.
10. **Ribbon-** Over the workbook is a section of command tabs named the Ribbon. Several options are present behind every tab of the ribbon.

## Advantages of Using MS Excel

- As there is no boundary to the amount of data that can be saved in a spreadsheet, MS Excel is extensively used to save or to analyze the data.
- Earlier when working with pen-paper mode, data were to be stored in different files and registers. Now, this has become helpful as more than one worksheet can be attached to a single MS Excel file.
- When the data is collected in the form of a table, explaining it becomes easier. Thus, data stored in the spreadsheet is more readable and recognizable.
- Performing various mathematical calculations such as addition, subtraction, average, and other operations have become more manageable and less time-consuming with the choice of the formula in MS excel.
- The information is drafted on a piece of paper, finding something in it may take longer, though this is not the case with excel spreadsheets. Locating and recovering data is easy and simple.

Enroll [Excel Tutorial for Beginners](#) here!

## MS Excel Extensions

- The by default format for saving a Microsoft Excel workbook is .xlsx
- For Excel Workbook (deprecated) the extension is .xls
- For Excel macro-enabled workbook the extension is .xlsm
- For Excel binary workbook the extension is .xlsb
- For the Excel template, the extension is .xltx
- For Excel macro-enabled template the extension is .xltx

We hope the above article on MS Excel is useful for candidates looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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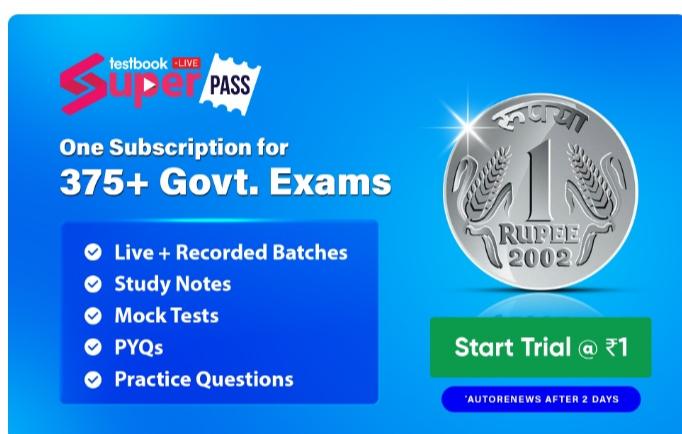


MS PowerPoint is a program that is covered in the Microsoft Office suite and is bundled unitedly with [Word](#), Excel, and other office productivity tools. Microsoft PowerPoint is a powerful slide show presentation program. MS PowerPoint applies slides to communicate information rich in multimedia.

## What is PowerPoint used for?

Microsoft PowerPoint or MS PowerPoint is useful in; Creating Presentation, where one can add animation, photos, videos, and sound effects making it more readable. Under this article, we will study in detail Microsoft PowerPoint, the features and functions of PowerPoint presentation, followed by a layout on how to work with MS PowerPoint, with the advantages and more.

Know more about [Computer Networks](#) here.



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## What is a PowerPoint Presentation?

Microsoft PowerPoint is great presentation software designed by Microsoft sometimes abbreviated as PP or PPT. PowerPoint is well utilized to create a slideshow of valuable information through charts, and images for a presentation. It is commonly practiced in business and school presentations.

1. It is an absolute presentation graphics package that gives you everything needed to create a professional-looking presentation. PowerPoint offers word processing, drawing, outlining, graphing, and presentation management tools.
2. PowerPoint was developed by Dennis Austin and Thomas Rudkin at a software company named Forethought Inc. It was thought to be identified as Presenter, but due to trademark issues was renamed PowerPoint in 1987.
3. The first iteration of PowerPoint was released collectively with Windows 3.0 in 1990.

4. The initial version of PowerPoint only allowed slide progression in one direction i.e forward and the amount of customization was somewhat limited.
5. Progressively, with every version, the program was more creative and more interactive. Numerous other characteristics were also added in PowerPoint in the later versions which massively increased the demand and use of this [MS Office](#) program.
6. The default file extension of a Powerpoint presentation is “.ppt”.
7. It is a presentation( PPT)-based program comprising slides that use graphics, videos, and other features to make a presentation more interactive and interesting.

## How to start MS PowerPoint on a Personal Computer?

Go through the below-mentioned steps to open MS PowerPoint on a personal computer:

**Click on the Start Menu→Go to All Programs→Click on MS Office→ Lastly choose the MS PowerPoint option.**

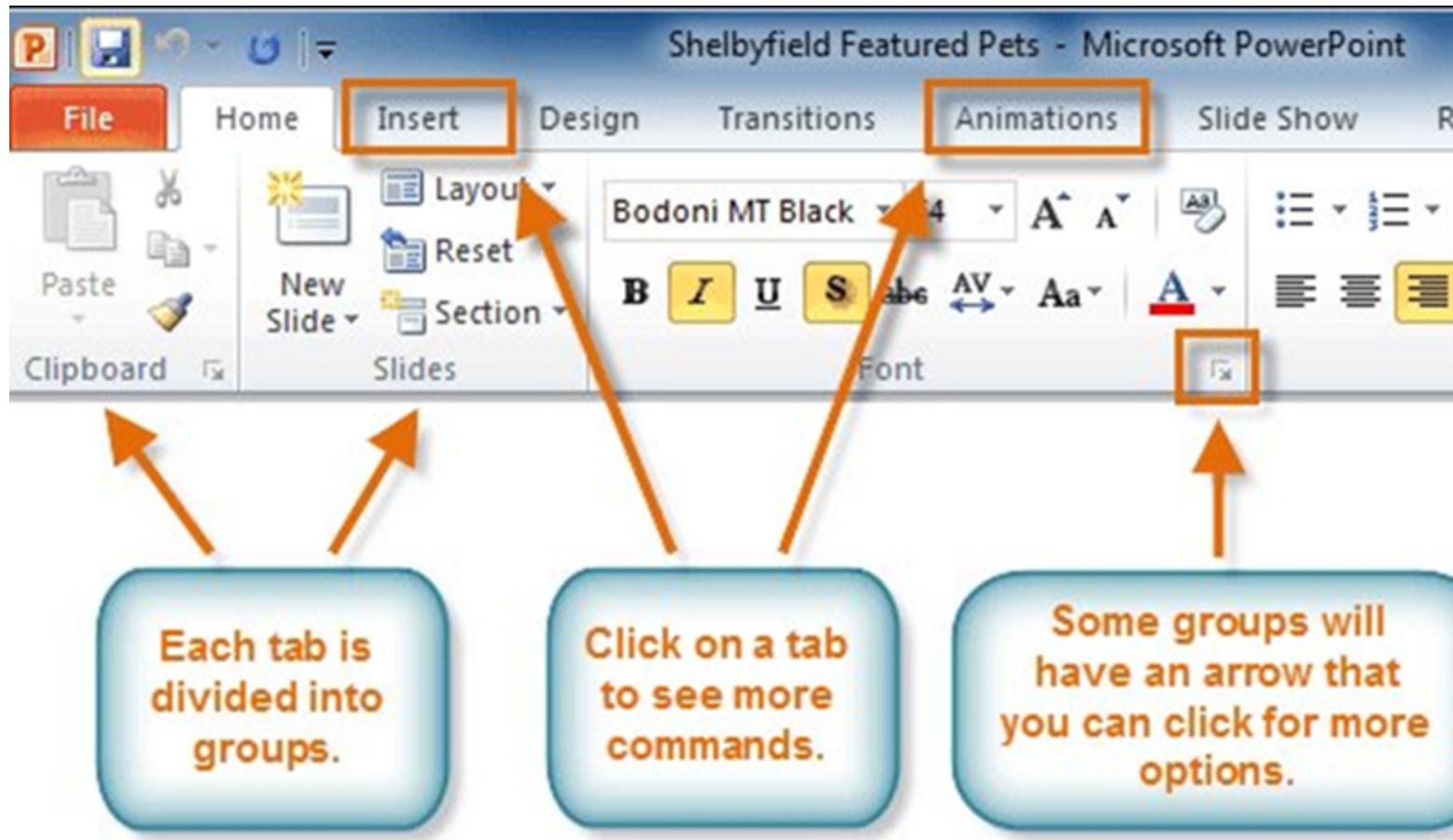
A blank presentation will be displayed on the screen. According to the requirement, one can modify the template for a presentation and begin working on the program.

Read more about [MS Excel](#), here.

The advertisement features a purple background with a large silver Indian rupee coin in the center. The coin has '1 RUPEE' and '2002' on it. Above the coin, the word 'Courses' is written in large yellow letters, and below it, 'for 375+ Exams' is written in white on a red banner. At the bottom left, there's a green button with the text 'Start Trial @ ₹1' and a smaller dark blue button below it with 'AUTO-RENEWS AFTER 2 DAYS'. To the right, there are three vertical icons: a monitor with a graduation cap, a clipboard with a document and a question mark, and a clipboard with a graduation cap.

## Features of MS PowerPoint

MS PowerPoint is an application that allows users to create slides and runs a slideshow.



## Home

Firstly, in PowerPoint, there are slides. Users need to add content to them to make a presentation. From the Home menu, users can add new slides, decide their sequence, layout, design & other word processing functions like font change, size change, etc. PowerPoint layout is used to change the layout of the current slide.

Learn more about [Generations of Computer](#), here.

## Insert

From the Insert menu, the user can add media like pictures, symbols, audio, video, header, footer, shapes, etc. to the slides to enhance the user's presentation.

## Design

The design menu offers the user with ready-made templates & background designs for slides that make the presentation look very attractive.

## Slideshow

Finally, from the Slideshow menu, the user can view the final form of the slideshow. Users can start the slideshow from the first slide or the slide that users are editing. They can also set display time for each slide from the 'Slideshow' menu.

Check out [Types of Computer Network Topology](#) here.

## Animations

During the slide show, the slides emerge on the screen one after the other. In case, one desires to add some animations to how a slide displays itself, they can refer to the "Animations" category.

Transition & Animation are the unique functions of PowerPoint. These menus offer different options in which the text appears on the slides & takes transitions from one slide to another.

With the Animation effect option, the animation effect is applied to the chosen content. Next with Custom Animation, different options will be provided for the animation effects like Entrance, Emphasis, Exit, and Motion path.

1. **Slide transition:** This group consists of animation effects that are applied to complete slides. During the slideshow, the slide begins as soon as it starts. This is termed the transition effect.
2. **PowerPoint Template:** Microsoft gives thousands of free, professionally outlined PowerPoint design templates. Several other sources of differing quality and prices are available online, as well.

## Review tab

The various tools that one can use under this tab are; Spelling, Research, Thesaurus, Translate, Language. The Research button aids in online research in books and Internet resources about a subject or topic you are working on.

Thesaurus tool lists words arranged together according to the similarity of meaning. By using Thesaurus in PowerPoint from the Review tab one can easily find synonyms for relative words in the content.

Translate Language is employed to change the English language words to another language. Next, is the New Comment option which is used to write a comment text correlated to a word or sentence on a slide. This comment can be further edited by edit comment and can be deleted also.

Next is the Protect Presentation option by which the data of the presentation is protected with the application of a password, after which it cannot be changed.

Know more about [Computer Virus](#) here.

## View tab

In the View tab, a user can have a Normal View of a presentation. This is also called the default view. It consists of slides where one can add content for the presentation. Next inline is the

Slide Sorter View where all the slides of the presentation are displayed in small form on the screen.

With the Notes Page tool, the slide is presented with its notes. The presentation/slideshow/run full screen with animation effects is done with the Slide Show option.

The slide master is practiced in the presentation to attach content such as a picture at one go on all sides with the same slide layout. Similar to the slide master with the handout master, a user can add content such as text to all handouts on the handout page applied to print the slide.

Next is the Notes Master tool, using which one can write any common text on all the notes pages at once.

There are other tools like Show/Hide Group wherein the Ruler tool one can hide or show the ruler bar, similarly with the Grid-lines tool gridlines can be hidden or made visible.

A message Bar is used to show or hide messages. With the zoom option, the slide can be zoomed more or less. Next is the Macro tool with which any action can be recorded in the presentation.

Also, check out the notes on [Microsoft Access](#), here.

# Uses of PowerPoint Presentation

1. PowerPoint presentations are helpful for both personal and professional practice. Below are some of the important uses of PowerPoint presentations.
2. In business, to invite investors or to explain the rise or drop in profits, MS PowerPoint can be used.

3. In the education field with the advancement of e-learning and smart classes as a common mode of education today, PowerPoint presentations play a major role in addressing education more interactively and draw the student's attention towards the modified version of studying.
4. As both graphics and text can be combined in a presentation, representing the growth of a company, the profit of a business, student's performance via marks, etc. is very simple using PPT.
5. In the area of marketing, PowerPoint presentations can be extremely valuable, as utilizing graphs and charts, numbers, facts, and figures along with the data can be shown more evidently and precisely which may be neglected by the viewer if being read.

Read more about [Microsoft Outlook](#), here.

We hope the above article on Microsoft PowerPoint is useful for candidates looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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- [OSI Model Open Systems Interconnection](#)

[Report An Error](#)



Microsoft Access functions as a Database Management System (DBMS) launched by Microsoft is a component of the [Microsoft Office](#) suite and stores data in its format. It helps users to be able to analyze humongous amounts of information and manage data more efficiently.

The application works by storing information that is related together and creates connections between different things to make a holistic and more easy-to-use database.

Within this article, we will convey to you a survey of MS Access, accompanied by its features and various uses that would be helpful for your overall knowledge as well as computer-based competitive exams.

## Introduction to MS Access

**MS Access** is an important application used for Data-entry by organizations. The first version of Access was released by Microsoft Corporation on 13th November 1992. Several file extensions are there depending on the file formats, the most common being the .adn extension.

- Microsoft Access offers the functionality of a database and the programming capabilities to build easy-to-navigate forms. It helps users to interpret large amounts of information, and manage data that combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools.
- Like relational databases, Microsoft Access also permits you to link relevant information efficiently.
- Multiple modifications were executed in the program and gradually Microsoft began releasing different versions of MS Access. Each new version arrived with a modified RAM and storage provision. It collects data in its format based on the Access Jet Database Engine.
- Access can operate directly with data from other sources, including traditional PC database programs, with many SQL (Structured Query Language) databases on the desktop/minicomputers/ servers/mainframes, and with data collected on the Internet or intranet web servers.

Also, learn about [Computer Fundamentals](#) here.

## About MS Access

Access describes anything that can hold a name and an object. Within an Access desktop database, the principal objects are forms, tables, reports, queries, macros, data macros, and modules.

### To practice MS Access, you will require to follow these four steps-

- Create your Microsoft Access database and define what kind of data you will be saving.
- After your database is built, everyday data can be inserted into the Access database.
- Query describes the method of retrieving data from the database.
- Information organized in the database can be printed in an Access Report.

Before MS Access 2007, the file extension used was “.mdb”, however, in MS Access 2007 the extension has been changed to “.accdb”.



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## Components of MS Access

Being Microsoft's primary accounting database the central use of MS Access is for accounting. It can be applied to handle invoices/bills, manage accounts, keep an eye on credit and debt, etc. MS Access utilizes "objects" to assist the user list and coordinate information, as well as develop specially designed reports.

Below mentioned are the major components of the MS Access database:

### Tables

- A table in Access is an object comparable to any other tabulated data; which stores data in the form of rows and columns.
- When a new table is created, Access asks to define fields that are also identified as column headings. Each field should possess a unique name and data type.
- A Table can be considered similar to other tables in the database file. The appearance of the table may seem similar to the one created in Excel with column heading and titles.
- Tables include fields/columns to store various kinds of data, such as name or address, furthermore, records or rows collect all the information about a particular instance of the subject, such as all the data regarding a customer or employee, etc.
- One can also define Primary Key in a table. This helps retrieve data more quickly.

### Queries

- Queries are an approach for searching and compiling data from one or more tables. Once a table is designed and the user or programmer is scanning for a calculated output, then it is called queries.
- Running a query means requesting a detailed question of your database. This may include filtering, calculating, sorting, updating, etc.
- When you construct a query in Access, you are defining special search provisions(limitations) to find exactly the data you want. Queries can pick from one or more relevant Tables and other Queries.
- Types of Query that can be used are; SELECT, INSERT, UPDATE, DELETE.

Know more about the [Generations of Computers](#) here.

## Forms

A user interface for a database application can be performed using forms. This implies forms assist the user to display live data from the table, which is mainly used to ease the process of data entry, editing, modifying, and viewing records.

## Report

- A report is an object in the desktop database. Once all the information is inserted into the database, it can be interpreted or examined using a report.
- Users can customize or modify the report look as per the requirement.
- A report allows formatting, printing, calculating, and summarizing the chosen data. Users can also view a report before printing it.
- As forms are employed for input purposes, the same way reports are used for output.

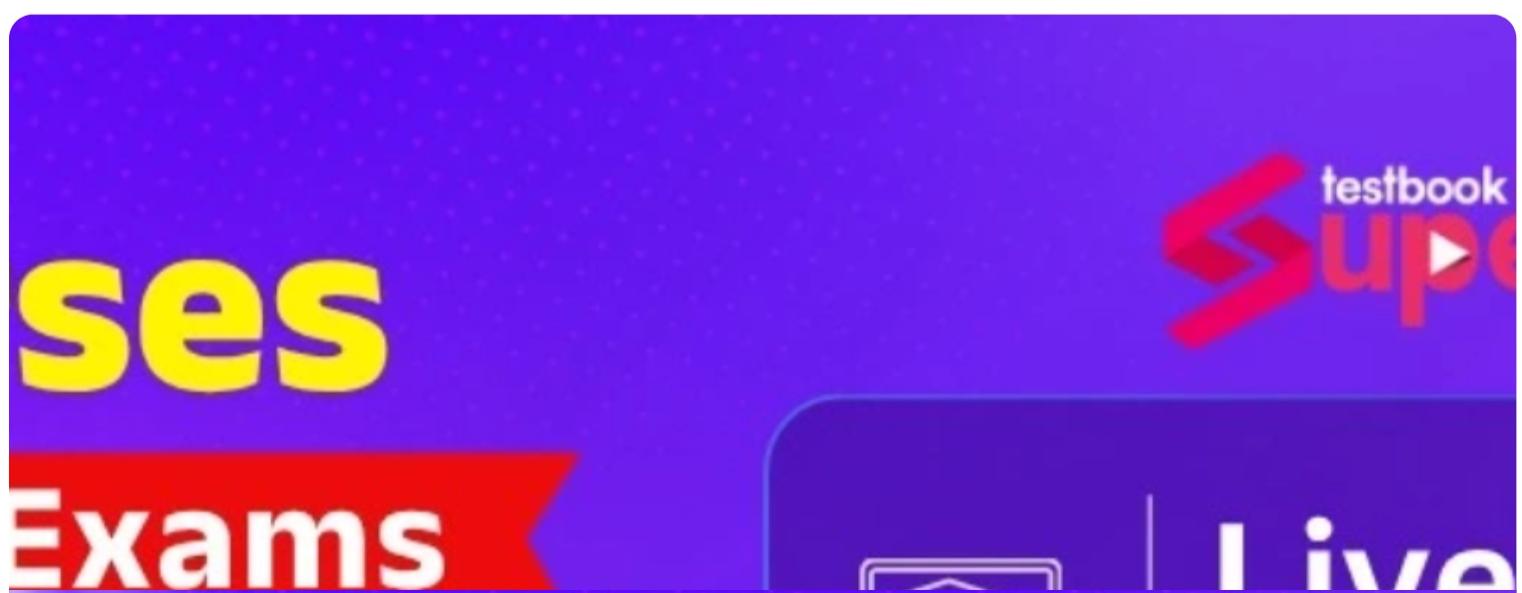
## Macros

- Macros are mini computer programming constructs using predefined actions which can automate tasks on an Access report.
- Multiple tasks like moving to another record, searching, or running a formula can be assigned and they will work whenever the macros option is chosen on a report.
- An Access Macro is a script for creating some jobs. For instance, to create a button that initiates a report, one can apply a macro that will fire OpenReport action.
- Users can use macros to open tables, initiate and administer queries, print or observe reports and can also involve simple conditions in macros to specify when one or more actions in the macro should be executed or skipped.
- Data( editing existing records, inserting new records, or deleting records) macros can be attached directly to table events.

## Module

- Modules are a set of pre-defined instructions created by a programmer in the database employing Visual Basic for Applications (VBA). They can be applied throughout the database.
- Modules give a more discrete flow of operations and allow the users to trap errors.
- Everything that can be performed in a macro can also be executed in a module, but in a module, the prompt feature of what is needed for each action is missing.
- Modules are considerably more powerful and are essential than macros if the user plans to write code for a multi-user environment.

Know more about [Microsoft Windows](#), here



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## Advantages and Limitations of MS Access

Discussed following are the advantages and limitations of MS Access.

### Advantages

- Access offers to build a fully functional database within a lesser time duration.
- It uses a very extensive programming language which makes it simple to introduce data from multiple sources into Access.
- Users can quickly customize MS Access according to personal and company needs.
- Microsoft Access online is compatible with development languages that run on Windows OS.
- MS-Access allows users with the facility to link data in its present location and use it for querying, observing, renewing, and reporting.
- With the help of Macros, users can create and connect tables, forms, queries, and reports.

Learn about the [Types of Computers](#) here.

### Limitations

- Too many people cannot use the identical database at a particular time.
- Microsoft Access database is beneficial for small-to-medium companies, but it is not that useful for large-sized companies.
- When a lot of information from the user's database is saved into one file, then this can slow down reports, queries, and forms.

- The same database was difficult to practice with the distinct OS.
- Efficiently working in Microsoft Access; demands a lot more knowledge and training compared with other Microsoft programs.

We hope the above article on Microsoft Access is helpful for aspirants looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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The MS Outlook application is a Personal Information Manager or in simple words, it is a form of a personal organizer like managing dates, tasks, and others.

Its primary work though is to send and receive emails. Outlook came into existence in the year 1997 and was launched as a part of the Microsoft Office Suite of 1997. MS Outlook is an application one needs to pay for to use while creating an email on outlook is free of cost.

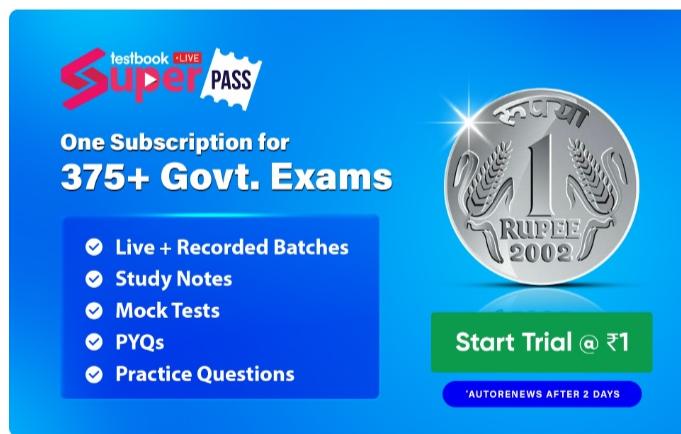
Through the article, we shall learn about Microsoft Outlook, its features, and uses along with a basic guide to the various versions followed by shortcut keys.

Read more about [Microsoft Powerpoint](#), here.

## About MS Outlook

1. MS Outlook works as a stand-alone application and also as a multi-user software. Therefore it can be practiced by an individual as an email client-server and additionally by a company that demands shared features like a calendar, mailbox, appointments, etc. With the start of Windows Vista, Microsoft introduced Windows Mail.
2. Outlook is an e-mail software program through Microsoft that permits users to transmit and accept email on their computers. Initially, the program was combined as a part of the Office suite in a computer system. Later on, various other versions were released which initiated Outlook compatibility with mobile phones, laptops, and other android and Mac devices. There are two versions of Outlook namely Microsoft Outlook Express, and Microsoft Outlook.
3. It handles email, contacts, tasks, to-do lists, calendars, and records or data on the hard drive. Outlook assists users to communicate through phone support, email, and group scheduling capabilities. In addition to this MS Outlook also assists to share information utilizing public folders, forms, and Internet connectivity.

Know more about [Microsoft Office](#) here.



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## The version of MS Outlook

### Outlook 97

Release Date- January 16, 1997.

Included in Office 97.

### Outlook 98

Release Date-June 21, 1998.

It was freely given with books and journals to track with the latest Internet standard.

Know more about [Microsoft Access](#), here.

### Outlook 2000

Release Date-June 27, 1999.

Included in Office 2000.

### Outlook 2002

Release Date-May 31, 2001.

Introduced in Office XP.

Induced with new features like colored tables, hyperlinks support for email, autocomplete for email addresses, MSN messenger integration, and also improved search functionality.

### Outlook 2003

Release Date-November 20, 2003.

Introduced in Office 2003.

Induced with new features like; filtering of mails to oppose spam, desktop alerts for emails were introduced, an expandable distribution list was added, along with Unicode support.

Learn more about [MS Excel](#), here.

### Outlook 2007

Release Date-January 27, 2007.

Included in Office 2007.

Induced with features like; the user can preview the attachments, was compatible to support Excel, Word, PowerPoint files, other characteristics like export of PDF and XLS files, calendar sharing, unified messaging support, etc. were also added to the application.

### Outlook 2010

Release Date-July 15, 2010.

Included in Office 2010.

Induced with features like; group messages could be assigned, scheduling a meeting through email message could be done, social networking platforms were launched along with the social connector feature.

Read more about [MS Words](#), here.

Outlook 2013

Release Date-January 29, 2013.

Included in Office 2013.

Included with features like; People hub, attachment prompt, development in startup performances, followed by confining of Outlook data file.

Outlook 2016

Release Date-September 22, 2015.

Included in Office 2016.

Included with features like; group redesign, cloud computing, search cloud were added.

Outlook 2019

Release Date-September 24, 2018.

Included in Office 2019 and Office 365.

Included with features like; multiple time zones addition supported a focussed inbox, filtering and sorting of mails became more manageable.

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## MS Outlook Features and Uses

### Scheduling Emails

1. Outlook enables the users to write an email and schedule(Scheduling emails) when they want it to go out.
2. Users can manage the view messages in their way, for example, can select a different color for an unread message and set priority. The same can be done with calendar appointments as well, for example, turn all the meetings with your boss a dark red, and meeting with other teammates through yellow color.

### Sharing Calendars and Contacts

1. Through Outlook users can share their calendars this can save time.
2. MS Outlook allows you to access your emails without possessing an internet connection. Because MS Outlook saves data in your system.
3. One can easily organize tasks, emails, and contacts efficiently MS Outlook which will surely impact productivity among all mail users in an organization.

### Tasks and Notes

1. Outlook also allows the users to create appointments, new meetings, tasks, and contacts through a single window.

2. Similar to calendars, task lists and contacts can also be shared, this is helpful wherein teamwork is involved.

2. Users can assign a certain task to someone and get notified also when it's done.

Read more about the [Difference Between MS Word and MS Excel](#), here.

## Microsoft Outlook shortcut keys

1. Alt+H-> For Go to Home tab
2. Alt+S-> For Sending a message/email
3. Ctrl+2->Switch to calendar
4. Ctrl+M->Send and receive all email
5. Ctrl+1->Switch to mail representation
6. Ctrl+3->Switch to the contacts
7. Ctrl+Shift+A->For creating an appointment
8. CTRL+4->Switch to tasks
9. CTRL+SHIFT+C->For Creating a new contact.
10. Ctrl+C->Copy selected text.
11. Ctrl+P->To open the Print window.

Know more about [Different Versions of Windows](#) here.

We hope the above article on Microsoft Outlook is helpful for aspirants looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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Computer Shortcut Keys assist in a simpler and faster method of navigating and executing commands in the computer software. Shortcut keys are implemented utilizing the Alt key on IBM computers/Command on Apple computers/Ctrl key/ Shift key in association with another shortcut keys of computer as per the requirement.

For example “Ctrl+S” tells the user to press and hold the Ctrl key, and then press the S key at the same time.

As you start to learn short cut keys, you’ll see that various applications share the same. As shortcut keys constitute an essential part of the computer awareness syllabus; this article presents a list of all shortcut keys, along with shortcut keys in computer for Windows, [MS Word](#), Excel, OUTLOOK, and more.

## Computer Shortcut Keys – Basic Key

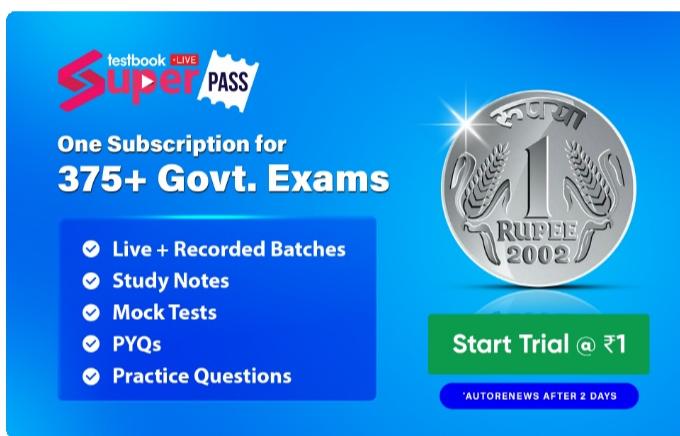
Basic **Computer Shortcut Keys** are essential for efficient computer use. Keys such as Ctrl+C (copy), Ctrl+V (paste), Ctrl+Z (undo), and Ctrl+A (select all) are some of the most commonly used shortcuts that can save time and increase productivity.

Learn shortcut keys of keyboard basics in the table mentioned below:

Shortcuts	Work of shortcuts
Alt + F	File menu options in the current program
Alt + E	Edits options in the current program
F1	Universal help (for any sort of program)
Ctrl + A	Selects all text
Ctrl + X	Cuts the selected item
Ctrl + Del	Cut selected item
Ctrl + C	Copy the selected item
Ctrl + Ins	Copy the selected item
Ctrl + V	Paste the selected item
Shift + Ins	Paste the selected item
Home	Takes the user to the start of the current line
Ctrl + Home	Go to the beginning of the document

End	Go to the end of the current line
Ctrl + End	Go to the end of a document
Shift + Home	Highlight from the prevailing position to the start of the line
Shift + End	Highlight from the prevailing position to end of the line
Ctrl + (Left arrow)	Move one term to the left at a time
Ctrl + (Right arrow)	Move one term to the right at a time

Learn about [Computer Abbreviations](#) here.



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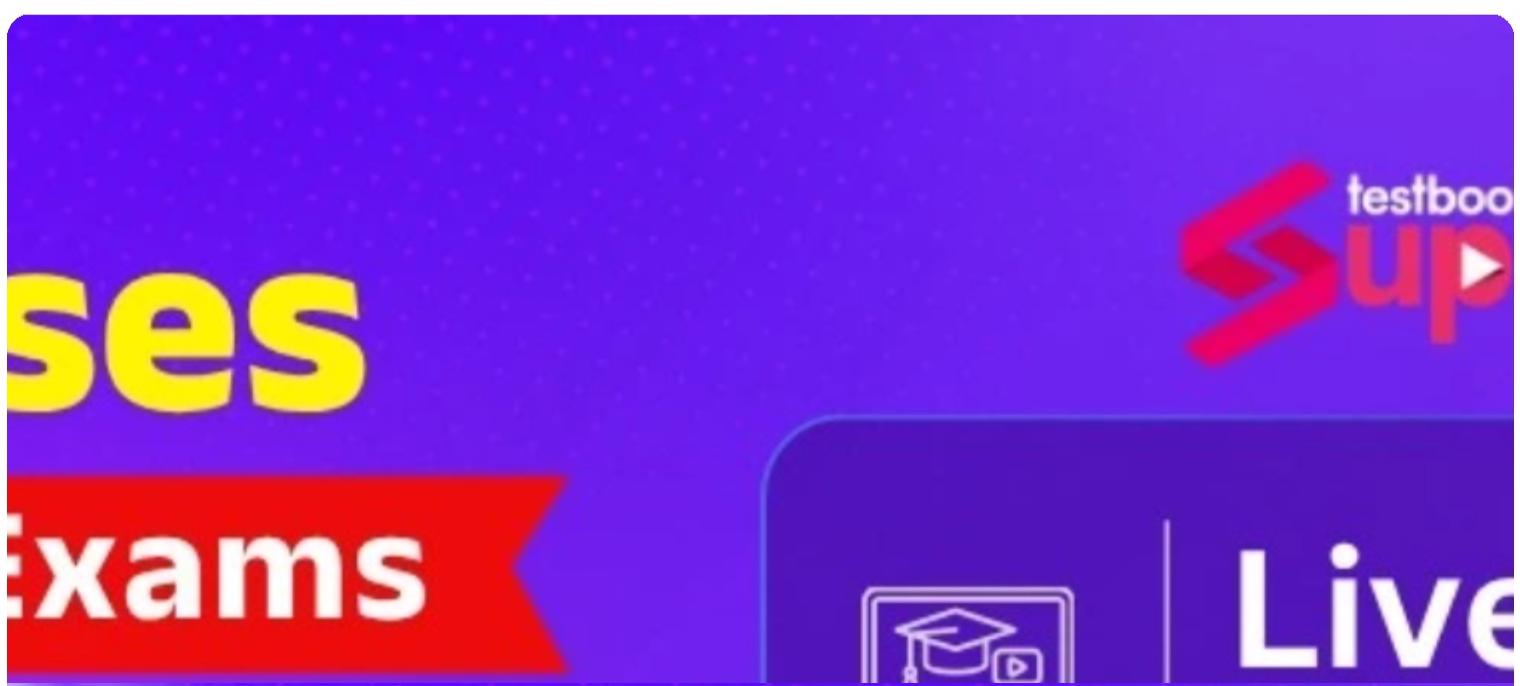
## Computer Shortcut Keys-Microsoft Windows

Microsoft Windows shortcut keys are a set of keyboard combinations that perform various tasks within the Windows operating system. These Computer Shortcut Keys can help users navigate and access different features quickly and efficiently, increasing productivity and saving time.

Shortcuts	Work of shortcuts
Alt + Tab	Switch between open applications

Alt + Shift + Tab	Switch backwards between open applications
Alt + Print Screen	Create a screenshot for the current program
Ctrl + Alt + Del	Reboot/Windows task manager
Ctrl + Esc	Bring up the start menu
Alt + Esc	Switch between applications on the taskbar
F2	Rename selected icon
F3	Start to find from the desktop
F4	Open the drive selection when browsing
F5	Refresh contents
Alt + F4	Close the current open program
Ctrl + F4	Close window in the program
Ctrl + Plus Key	Automatically set widths of all columns in Windows Explorer
Alt + Enter	Open properties window of selected icon or program
Shift + F10	Simulate right-click on selected item
Shift + Del	Delete programs/files permanently

Also, learn about [Microsoft Windows](#) here.



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## Computer Shortcut Keys-MS Word

MS Word shortcut keys include Ctrl+C (copy), Ctrl+V (paste), Ctrl+Z (undo), Ctrl+B (bold), and Ctrl+I (italic). These Computer Shortcut Keys can save time and increase productivity while creating, editing, and formatting documents in Microsoft Word.

Shortcuts	Work of shortcuts
Ctrl + B	Bold highlighted selection
Ctrl + C	Copy selected text
Ctrl + X	Cut selected text
Ctrl + N	Open new/blank document
Ctrl + O	Open options
Ctrl + P	Open the print window

Ctrl + F	Open find box
Ctrl + I	Italicize highlighted selection
Ctrl + K	Insert link
Ctrl + U	Underline highlighted selection
Ctrl + V	Paste
Ctrl + G	Find and replace options
Ctrl + H	Find and replace options
Ctrl + J	Justify paragraph alignment
Ctrl + L	Align selected text or line to the left
Ctrl + Q	Align selected paragraph to the left
Ctrl + E	Align selected text or line to the centre
Ctrl + R	Align selected text or line to the right
Ctrl + M	Indent the paragraph
Ctrl + T	Hanging indent
Ctrl + D	Font options
Ctrl + Shift + F	Change the font
Ctrl + Shift + >	Increase selected font +1
Ctrl + ]	Increase selected font +1
Ctrl + [	Decrease selected font -1
Ctrl + Shift + *	View or hide non printing characters
Ctrl + (Left arrow)	Move one word to the left
Ctrl + (Right arrow)	Move one word to the right

Ctrl + (Up arrow)	Move to the beginning of the line or paragraph
Ctrl + (Down arrow)	Move to the end of the paragraph
Ctrl + Del	Delete the word to the right of the cursor
Ctrl + Backspace	Delete the word to the left of the cursor
Ctrl + End	Move the cursor to the end of the document
Ctrl + Home	Move the cursor to the beginning of the document
Ctrl + Space	Reset highlighted text to the default font
Ctrl + 1	Single-space lines
Ctrl + 2	Double-space lines
Ctrl + 5	1.5-line spacing
Ctrl + Alt + 1	Change text to heading 1
Ctrl + Alt + 2	Change text to heading 2
Ctrl + Alt + 3	Change text to heading 3
Shift + F3	Change case of selected text
Shift + Insert	Paste
F4	Repeat the last action performed (Word 2000+)
F7	Spell check selected text and/or document
Shift + F7	Activate the thesaurus
F12	Save as
Ctrl + S	Save
Shift + F12	Save
Alt + Shift + D	Insert the current date

Alt + Shift + T	Insert the current time
Ctrl + W	Close document
Ctrl+=	Set chosen text as a subscript.
Ctrl+Shift+=	Set chosen text as superscript.

Also, learn about [Microsoft Office](#) here.

## Computer Shortcut Keys- MS Excel

MS Excel shortcut keys include Ctrl+C (copy), Ctrl+V (paste), F2 (edit cell), F4 (repeat last action), and Ctrl+Shift+Arrow Keys (select multiple cells). These Computer Shortcut Keys can significantly increase productivity and save time.

Shortcuts	Work of shortcuts
F2	Edit the selected cell
F5	Go to a specific cell
F7	Spell check selected text and/or document
F11	Create chart
Ctrl + Shift +;	Enter the current time
Ctrl +;	Enter the current date
Alt + Shift + F1	Insert new worksheet
Shift + F3	Open the Excel formula window
Shift + F5	Bring up the search box
Ctrl + B	Bold highlighted selection
Ctrl + I	Italicize highlighted selection
Ctrl + D	Fill
Ctrl + K	Insert link
Ctrl + F	Open find and replace options

Ctrl + G	Open go-to options
Ctrl + H	Open find and replace options
Ctrl + U	Underline highlighted selection
Ctrl + Y	Underline selected text
Ctrl + 5	Strikethrough highlighted selection
Ctrl + O	Open options
Ctrl + N	Open new document
Ctrl + P	Open print dialog box
Ctrl + Z	Undo the last action
Ctrl + F9	Minimize current window
Ctrl + F10	Maximize currently selected window
Ctrl + F6	Switch between open workbooks/windows
Ctrl + Page up & Page Down	Move between Excel worksheets in the same document
Ctrl + Tab	Move between two or more open Excel files
Alt + =	Create the formula to sum all of the above cells
Ctrl +	Insert the value of the above cell into the current cell
Ctrl + Shift + !	Format number in comma format
Ctrl + Shift + \$	Format number in currency format
Ctrl + Shift + #	Format number in date format
Ctrl + Shift + %	Format number in percentage format
Ctrl + Shift + ^	Format number in scientific format
Ctrl + Shift + @	Format number in time format

Ctrl + (Right arrow)	Move to next section of text
Ctrl + Space	Select entire column
Shift + Space	Select entire row
Ctrl + W	Close document

Know more about the [Different Versions of Windows](#) here.

## Computer Shortcut Keys- Powerpoint

Microsoft PowerPoint is a widely used presentation software that can help you create impressive slideshows. Knowing the right Computer Shortcut Keys can help you save a lot of time and effort. For example, Ctrl+C and Ctrl+V for copy and paste, or F5 to start a slideshow. There are many more, so take some time to learn them!

Shortcuts	Work of shortcuts
Esc	Exit the slide show and go back to the earlier live view.
Ctrl+K	Enter a hyperlink.
Ctrl+M	Include a new, blank slide after the chosen slide.
Ctrl+N	Open a new, blank slide in a different PowerPoint program window.
CTRL + D	Duplicate the current slide
Ctrl+Shift+>	Increases the chosen text size by one font size.
Ctrl+Shift+<	Decreases the chosen text size by one font size.
CTRL + G	Group things together
F5	Start presentation from the initial slide

Read more about [Microsoft Outlook](#), here.

We hope the above article on Computer Shortcut Keys is helpful for aspirants looking for such insights. For more, download and install the [Testbook App](#) or visit the testbook website for more updates on such similar topics from Computer Awareness, and numerous such subjects can even check the test series available to examine your knowledge regarding various exams.

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