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# Computer Abbreviations For All Competitive Exams

1. AI – Artificial intelligence
2. ALGOL – Algorithmic Language
3. ARP – Address resolution Protocol
4. ASP- Active Server Pages
5. ASCII – American Standard Code for Information Interchange
6. AMR - Adaptive Multi-Rate Codec
7. AAC - Advanced Audio Coding
8. ATA – Advanced Technology Attachment ABR – Average Bit rate
9. AMOLED – Active-Matrix Organic Light-Emitting Diode
10. AMD – Advanced Micro Devices
11. AVI – Audio Video Interleaved
12. ATM – Asynchronous Transfer Mode
13. ANSI - American National Standard Institute
14. ARPANET- Advanced Research Projects Agency Network
15. ADSL -Asymmetric Digital Subscriber Line
16. API -Application Program Interface
17. ACID- Atomicity Consistency Isolation Durability
18. BINAC - Binary Automatic Computer
19. BCC – Blind Carbon Copy
20. BASIC - Beginner’s All-purpose Symbolic Instruction Code
21. BIOS – Basic Input Output System

22. BCD - Binary Coded Decimal
  23. BHTML - Broadcast Hyper Text Markup Language
  24. BIU - Bus Interface Unit
  25. BMP - Bitmap
  26. BPS - Bytes Per Second
  27. BBP - Base band Processor
  28. BPM - Business Process Modeling
  29. BGP - Border Gateway Protocol
  30. BIPS - Billion Instruction Per Second
  31. BCR - Bar Code Reader
  32. BRD - Blu Ray Disc
  33. CAD - Computer Aided Design
  34. CC - Carbon Copy
  35. COBOL - Common Business Oriented Language
  36. CD - Compact Disc
  37. CRT - Cathode Ray Tube
  38. CD-R - Compact Disc Recordable
  39. CDROM - Compact Disc Read Only Memory
  40. CDRW - Compact Disc Rewritable
  41. CSS - Cascading Style Sheets
  42. CISC- Complex Instructions Set Computers
  43. CUI - Character User Interface
  44. CDMA- Code Division Multiple Access
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45. COMPUTER- Common Operating Machine Purposely Used for Technological and Educational Research.
  46. CAN - Campus Area Network
  47. CNM- Circulatory Network Mode
  48. DBA – Data Base Administrator
  49. DBMS – Data Base Management System
  50. DNS – Domain Name System
  51. DPI – Dots Per Inch
  52. DRAM – Dynamic Random Access Memory
  53. DVD – Digital Video Disc/Digital Versatile Disc
  54. DVDR – Digital Versatile Disc Recordable
  55. DVDROM – DVD Read Only Memory
  56. DVDRW – DVD Rewritable
  57. DVR – Digital Video Recorder
  58. DOS – Disk Operating System
  59. DHCP - Dynamic Host Configuration Protocol
  60. DSL- Digital Subscriber Line
  61. DHTML Dynamic Hyper Text Markup Language
  62. EBCDIC – Extended Binary Coded Decimal Interchange Code
  63. e-Commerce – Electronic Commerce
  64. EDP – Electronic Data Processing
  65. EEPROM – Electrically Erasable Programmable Read Only Memory
  66. e-Mail – Electronic Mail
  67. ENIAC - Electronic Numerical Integrator and Computer
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68. EOF - End Of File
  69. EPROM - Erasable Programmable Read Only Memory
  70. EDI - Electronic Data Interchange
  71. FAX - Far Away Xerox/ facsimile
  72. FDC - Floppy Disk Controller
  73. FDD - Floppy Disk Drive
  74. FORTRAN - Formula Translation
  75. FS - File System
  76. FTP - File Transfer Protocol
  77. FIFO - First In First Out
  78. FAT - File Allocation Table
  79. GPRS - General Packet Radio Service
  80. GPS - Global Positioning System
  81. GUI - Graphical User Interface
  82. Gb - Gigabit
  83. GB - Gigabyte
  84. GIF - Graphics Interchange Format
  85. GSM - Global System for Mobile Communication
  86. GIGO - Garbage in Garbage Out
  87. HDD - Hard Disk Drive
  88. HP - Hewlett Packard
  89. HTML - Hyper Text Markup Language
  90. HTTP - Hyper Text Transfer Protocol
  91. HTTPS - Hyper Text Transfer Protocol Secure
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92. HDMI - High Definition Multimedia Interface
  93. HDTV - High Definition Television
  94. HVD- Holographic Versatile Disc
  95. INTEL - Integrated Electronics
  96. IP - Internet Protocol.
  97. IC- Integrated Circuit
  98. ISP - Internet Service Provider.
  99. IMAP- Internet Message Access Protocol
  100. IVR- Interactive Voice Response
  101. ICANN - Internet Corporation of Assign Names & Numbers
  102. ISDN - Integrated Servers Digital Network
  103. JAD - Java Application Descriptor
  104. JPEG - Joint Photographic Expert Group
  105. Kb - Kilobit
  106. KB - Kilobyte
  107. KHz - Kilohertz
  108. Kbps - Kilobit Per Second
  109. LED - Light Emitting Diode
  110. LCD – Liquid Crystal Display
  111. LIFO- Last In First Out
  112. Mb – Megabit
  113. MB – Megabyte
  114. MPEG – Moving Picture Experts Group
  115. MMS – Multimedia Message Service
-

116. MICR – Magnetic Ink Character reader
  117. MIPS – Million Instructions Per Second
  118. MIME - Multipurpose Internet Mail Extension
  119. MIDI - Musical Instrument Digital Interface
  120. MANET - Mobile Ad-Hoc Network
  121. Mbps- megabits per second
  122. MAC- Media Access Control
  123. MODEM- Modulator Demodulator
  124. NAT - Network Address Translation
  125. NIC – Network Interface Card
  126. NOS – Network Operating System
  127. NTP - Network Time Protocol
  128. OMR – Optical Mark Reader
  129. OOP – Object Oriented Programming
  130. OSS – Open Source Software
  131. OS- Operating System
  132. OCR -Optical Character Reader / Recognition
  133. P2P - Peer-to-peer
  134. PDA - Personal digital assistant.
  135. PDF - Portable Document Format
  136. PNG - Portable Network Graphics
  137. POS – Point Of Sale
  138. PPP – Point-to-Point Protocol
  139. PROM – Programmable Read Only Memory
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140. PSTN – Public Switched Telephone Network
  141. PING – Packet Internet Gopher
  142. PAN- Personal Area Network
  143. PCB -Printer Circuit Board
  144. PCB - Printer Circuit Board
  145. PHP- Hypertext Preprocessor
  146. RAM – Random Access Memory
  147. ROM -Read Only Memory
  148. RDBMS – Relational Data Base Management System
  149. RIP – Routing Information Protocol
  150. RTF – Rich Text Format
  151. RARP - Reverse Address Resolution Protocol
  152. SMTP – Simple Mail Transfer Protocol
  153. SQL – Structured Query Language
  154. SRAM – Static Random Access Memory
  155. SNMP – Simple Network Management Protocol
  156. SIM – Subscriber Identification Module
  157. SMPS - Switch Mode Power Supply
  158. SFTP Secure File Transfer Protocol
  159. SSH - Secure Shell
  160. SIP - Session Initiation Protocol
  161. SAN -Storage Area Network
  162. TCP – Transmission Control Protocol
  163. TB – Tera Bytes
-



164. TFTP --Trivial File Transfer Protocol
  165. Tel Net - Telecommunication Networking
  166. TIPS -Trillion Instruction Per Second
  167. UPS – Uninterrupted Power Supply
  168. URI – Uniform Resource Identifier
  169. URL – Uniform Resource Locator
  170. USB - Universal Serial Bus
  171. ULSI - Ultra Large Scale Integration
  172. UNIVAC - Universal Automatic Computer
  173. UMTS - Universal Mobile Telecommunication System.
  174. UDP -User Datagram Protocol
  175. VIRUS - Vital Information Resource Under Seized
  176. VOIP - Voice Over Internet Protocol
  177. VAR – Variable
  178. VGA – Video Graphics Array
  179. VSNL – Videsh Sanchar Nigam Limited
  180. VDU – Visual Display Unit
  181. VAN - Value Added Network
  182. VIRUS- Vital Information Resource Under Siege
  183. WAIS - Wide-Area Information Server.
  184. Wi-Fi – Wireless Fidelity
  185. WLAN – Wireless Local Area Network
  186. WPA – Wi-Fi Protected Access
  187. WWW – World Wide Web
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188. WORM – Write Once Read Many
189. WBMP - Wireless Bitmap Image
190. WMA - Windows Media Audio
191. WMV - Windows Media Video
192. WIMAX- Worldwide Interoperability for Microwave Access
193. XHTML – eXtensible Hypertext Markup Language
194. XML - eXtensible Markup language
195. ZB – ZettaByte



# Computer Awareness Study Material

## {Part – I}

### **Cookies**

A cookie is a text string that is included with Hypertext Transfer Protocol requests and responses. Cookies are used to maintain information as we navigate different pages on a website or return to the website at a later time. Cookies cannot be used to run code (programmes) or deliver viruses to computer. One of their primary purposes is to provide a convenience feature that one can use to save time — it tells the web server that you have returned to the page. If you personalize web pages or register for products and services, a cookie helps the page server recall your specific information, like billing address, shipping address.

### **Internet**

Internet is a network connecting many computer networks and based on a common addressing system and communications protocol.

- It was **J.C.R. Licklider** of the Massachusetts of Technology, who first proposed a global network of computers in 1962, and moved to the Defense Advanced Research Projects Agency (DARPA) to develop it.
- **Leonard Kleinrock** developed the theory of packet switching, the basis of Internet connections.
- On September 2, 1969, **Stephen Crocker and Vinton Cerf**, two graduate students at the University of California Los Angeles (UCLA), linked two large computers using a 15-foot cable and tested a new way to exchange data.
- In January, three other “nodes” were added to this network.
- The earliest idea of a computer network intended to allow general communication between users of various computers was the ARPANET, the world’s first packet switching network. It was in December 1969 that ARPA (Advanced Research Projects Agency) went online connecting four major U.S. universities. Designed for research, education, and government organizations, it provides a communications network linking the country in the event that a military attack destroys conventional communications systems.
- In 1972, E-mail was introduced by **Ray Tomlinson**, a programmer at Bolt, Beranek and Newman, an engineering company in Cambridge, Massachusetts. He used the @ to distinguish between the sender’s name and network name in the email address.

### **Why the symbol @ used in e-mail is addresses?**

An e-mail address identifies a location to which e-mail messages can be delivered. Ray Tomlinson needed a way to separate, in the email address, the name of the user from the machine the user

was on. He wanted a character that would not, under any conceivable circumstances, be found in the user's name. He looked down at the keyboard and chose the @ sign among various punctuation marks available on his Model 33 teletype keyboard, without an idea that he was creating an icon for the internet world. A general format for an e-mail address is: username@computer\_name. The part before the @ sign is the local part of the address, the user name of the recipient, and the part after the @ sign is the domain part which is a host computer name.

**The '@' symbol indicates that the user can be reached on the Internet by giving the email address(also called the User's Uniform Resource Locator (URL)).**

- In 1973, the Transmission Control Protocol/Internet Protocol (TCP/IP) was designed and in 1983 it became the standard for communicating between computers over the Internet. In 1976, US Presidential candidate Jimmy Carter and running mate Walter Mondale used email to plan campaign events. In the same year, Queen Elizabeth sent her first email, becoming the first state leader to do so. In 1982, the term "Internet" was used for the first time.

### **Files on Internet**

The internet is a collection of a large number of client-server based systems. So all files and other resources on it are stored on secondary storage devices of the respective servers. Servers of websites are termed as web servers. When we type in a URL of a website in the address bar of browser, it makes a connection to that web server which in turn fetches the data from the secondary storage device (such as the hard disk) that they must be using and returns it to the respective browser. The same holds true for any other resource (image, MP3 file, zipped file, etc.) that you access on the internet.

*Common methods of Internet access in homes include dial-up, landline broadband (over coaxial cable, fiber optic or copper wires), Wi-Fi, satellite and 3G/4G technology cell phones. Public places to use the Internet include libraries and Internet cafes, where computers with Internet connections are available. There are also Internet access points in many public places such as airport halls and coffee shops, in some cases just for brief use while standing. Various terms are used, such as "public Internet kiosk", "public access terminal", and "Web payphone". Many hotels now also have public terminals, though these are usually fee-based. These terminals are widely accessed for various usage like ticket booking, bank deposit, online payment etc. Wi-Fi provides wireless access to computer networks, and therefore can do so to the Internet itself. (wiki)*

### **Buffering in internet**

Buffering is a situation which occurs when a streaming media player is saving portions of a streaming media file to local storage for playback. Most streaming media players buffer a small percentage of a streaming media presentation before beginning to play it. Buffering also may occur in the middle of a presentation when available bandwidth does not match the presentation's required bandwidth.

### **How do search engines work?**

A search engine does not search the entire Internet, but databases of Web pages. When a designer contacts a search engine for the addition of his website in the database, a program called Spider visits the site, reads the pages, indexes the contents and follows links to move on. Search engines like Google use algorithms to find pages with matter relevant to the keywords entered by the user.

If the title or headings of the page contain the keywords, then it gets higher preference. Google also uses a patented algorithm called PageRank system that ranks a website based on how many sites have links to it and their ranks as well.

## Basic Components of Networks

A network has 5 basic components viz. clients, servers, channels, interface devices and operating systems.

### A brief intro:

1. **Servers:** Servers or Host computers are powerful computers that store data or applications and connect to resources that are shared by the users of a network.
2. **Clients:** Client is the computer used by the users of the network to access the servers and shared resources (such as hard disks and printers). So, a personal computer is a client.
3. **Channels:** The technical name of channels is network circuit. It is the pathway over which information travels between the different computers (clients and servers) that comprise the network.
4. **Interface devices:** The devices that connect clients and servers (and sometimes other networks) to the channel are called interface devices. The common examples are modems and network interface cards.
5. **Operating systems:** This is the Network Software. It serves purpose that the operating system serves in a stand-alone computer.

## Channel Dimensions

There are a number of varieties of the types, speeds and capabilities of network channels. These may be Transmission medium such as wireless or wire line, Transmission rate or bandwidth, Transmission directional capability and the Type of the Signal.

- **Transmission medium** is the physical medium of the channel, which can be either wire line or wireless. The wire line is called the **guided media** or line based media. The wire line are of several kinds such as twisted pair wire, coaxial cable and fiber optic cable. The wireless media there is no physical wire along which information travels and the information is transmitted without wires from one transmission station to the next. Common examples are radio, mobile networks, microwave and satellite.
- **Transmission rate** or bandwidth shows how fast information can be transmitted over the channel. It is measured in bits per second (bps).
- **Transmission directional capability** refers to the direction in which information can be transmitted over a channel; It can be simplex, half-duplex or full-duplex. Simplex means that information can be transmitted only in one direction, Half-duplex means that information can be transmitted in both directions, but only in one direction at a time. Full-duplex means that Information can be transmitted in both directions simultaneously.
- **Signal type** can be analog and digital. Analog signals are 'continuous' (they take on a wide range of values) and digital signals are 'discrete', and binary (take on only two values). So, Digital signals are more suitable for computer networks because, computers represent all information in binary.

## Network Protocols

A protocol is more like a language that can be shared by many people. If all the people would like to use the same language, the protocol becomes a standard. The same is applicable with networks.

Most networks have one feature in common that they transmit information by breaking the original information into a set of messages (called packets), transmitting these packets sequentially, and then reassembling these packets back into the original information.

Each packet is a string of bits. But these packets sometimes have to travel a long way, over a bunch of different networks, there are typically lots of computers sending and receiving information over the same network, and the information getting sent can often get altered during transmission (this is called a transmission error). In order to make sure that the original information gets transmitted correctly, to the right place, computer networks use a set of rules, called networking protocols.

Thus, a data communication protocol is a set of rules that must be followed for two electronic devices to communicate with each other. These rules cover:

- Syntax: Data format and coding
- Semantics: Control information and error handling
- Timing: Special matching and sequence

### **The tasks which a protocol does fall into two categories**

1. Network layer tasks
2. Data-link layer tasks

The rules associated with each category are called network layer protocols and data-link layer protocols. **Network-layer protocols**

Network-layer protocols are also known as Layer-3 protocols. These rules specify how a network does the following three tasks:

1. Packetizing: breaking up the information into packets, and reassembling the packets at the receiving end.
2. Addressing: Determining which computer and network the packets are headed to.
3. Routing: Determining the best way for the packets to get to where they are headed.

The most common example of Network-layer Protocol is TCP/IP.

### **Data-link layer protocols**

The Data-link layer protocols are also known as Layer-2 protocols. These rules specify how a network does the following three tasks:

1. Delineation: Figuring out when a message (packet) begins and ends.
2. Error control: Figuring out when a transmission error has occurred, and correcting it.
3. Channel access: Controlling when a particular client or server accesses the channel.

Ethernet is the most common example of Layer-2 protocol. The token ring protocol, developed by IBM is another example. The networks that we connect to from home using a telephone line typically use one of two data link protocols: SLIP or PPP.

### **Routers , Bridges & Backbone**

The facilities on most LANs are very powerful. Most organizations do not wish to have small isolated islands of computing facilities confined to the buildings. They want to extend facilities over a wider area so that groups can work without having to be located together. Two or more LANs can be connected with specialized devices called Routers and bridges. Bridge connects LANs of the same type but, router is a more intelligent component that can interconnect many different types of computer network. Then, we can have Backbone Networks, which are high-bandwidth channels that typically connect LANs with each other, and are often referred to as backbones.

## **LAN, WAN & MANs**

Local Area Networks (LANs) is confined to a fairly small geographic area. The clients and servers on a LAN are connected to the same channel, and are typically in the same building or in neighboring buildings. The Metropolitan Area Networks (MANs) spans a wider area than LAN and Wide Area Networks (WANs) spread over a large geographic area, such as a country or a state.

## **How does a firewall work?**

In computer security, a firewall is a device that blocks unauthorized access to an organization's local area network. A firewall can reside on the administrative computer, the server that acts as the LAN's gateway to the Internet. The firewall keeps track of every file entering or leaving the local area network in order to detect the source of viruses and other problems that might enter the network.

## **Development History of Ethernet**

A network consists of multiple computers connected using some type of interface, each having one or more interface devices. The primitive computers were the self contained devices in which the data was confined in it. The only way to transfer the data from one machine to another was to take the data in a storage device and send it across the machine. So, this necessity led to invention and development in the networks. In a computer network, the autonomous computers are interconnected and are able to communicate with each other. Networks enable the sharing of data among groups of computers and their users.

- Computer Networking began at the same time as computers themselves. In 1940 George Stibitz and Samuel Williams, at AT&T's Bell Laboratories, developed their Complex Number Generator, one of the earliest digital computers and then, they made it possible for users to operate the computer remotely from teletype machines on three different floors in their Manhattan building. They also developed a system to allow users to communicate with the machine even more remotely, via telex machines. This was the beginning of the Networking era.
- In 1964, Drs John Kemeny and Tom Kurtz of Dartmouth College in New Hampshire developed not only the simplified BASIC programming language (Beginners All-purpose Symbolic Instruction Code) but also a system called time sharing, which allowed many students to use a single computer at what seemed like the same time, from a large number of teleprinter terminals spread around the campus and elsewhere.
- However, networking is said to have started in 1976, when researchers Dr Robert Metcalfe and Dr David Boggs of the Xerox Palo Alto Research Center (PARC) presented details of a Local Computer Networking System which allowed data to be transferred between a number of computers and printers, at 2.94Mb/s (megabits per second), which was considered to be a very high speed. They dubbed the new networking system **Ethernet**.

- **Xerox Corporation was granted a patent for Ethernet** in 1977. Then in 1979 Xerox teamed up with Digital Equipment Corporation and Intel to define the first official standard specification for Ethernet. This Ethernet Version 1.0 was capable of transferring data at 10Mb/s over fairly thick (10mm diameter) 50W coaxial cable. It was called 'Thick Ethernet' or '10Base5'. The meaning of 10Base5 is that it allowed a 10Mb/s data rate, it used baseband transmission rather than a modulated high-frequency carrier, and would give reliable data communication over cable lengths up to 500 meters.
- A few years later, the 802.3 working group of the IEEE (Institution of Electrical and Electronics Engineers) released its first industry standard for Ethernet, giving it the name IEEE 802.3 Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications. This was the refined version of DEC-Intel-Xerox Thick Ethernet.
- In 1985, the IEEE working group came out with 'thin' Ethernet, also known as 'cheapernet' or 10Base2'. This specified the use of thinner (5mm diameter) 50W coaxial cable, which still allowed 10 Mb/s baseband transmissions as before, but with a maximum cable length of 185 meters.
- It was followed by IEEE 802.3i or 10BaseT Ethernet standard, released in 1990. 10BaseT opened the door to much cheaper networking because it allowed 10 Mb/s transmissions over the low cost 100W unshielded twisted-pair or 'UTP' Category 3 cabling which had by then become widely used for telephone wiring in buildings.
- In 1995 IEEE working group released the 802.3u standard. This became known as '100BaseT' or 'Fast Ethernet, which had 10 times the speed of 10BaseT.
- In 1997 came IEEE 802.3x, which defined full duplex or simultaneous two-way data communication over either 10BaseT or 100BaseT. Before this development, Ethernet allowed only half duplex or 'one way at a time' communication .
- In 1998 and 1999, the IEEE working group released four different implementations of the 802.3z 'Gigabit Ethernet' standard, achieving 1Gb/s transmission or another 10-times increase in data transfer rates.
- Please note that out of above, **10BaseT and 100BaseT**, turn out to be very suitable and cost-effective for both home and small office networking and are widely used today.

### **What is Linux Operating system?**

Linux is an open source operating system developed by **Linus Torvalds** as a version of UNIX that could run on a home computer. Linux is considered to be a faster, safer operating system. He patented Linux in 1991, and then made the system and its code available to others, free of charge, over the Internet. He licensed the system in such a way that anyone can copy and use it, but any improved versions a user creates must be made available to others under the same term, so this was under the GNU GPL. This was more than enough to make the computer programmers from all over the world to flock and make additions and advance.

Most popular Open Source Programmes are as follows:

### **Application software**

- Open Office- Office Suite
- Blender — 3D graphics editor
- GIMP — graphics editor
- 7-Zip — file archiver
- Libre Office — office suite
- Mozilla Thunderbird — e-mail client
- Mozilla Firefox — web browser



- Google Chrome — web browser

### Type of Linux Operating systems

- FreeBSD — operating system derived from Unix
- Haiku — free and open source operating system.
- Linux/GNU — family of Unix-like operating systems
- OpenSolaris — Sun Microsystems's discontinued operating system derived from Unix
- Symbian — real-time mobile operating system
- Ubuntu is a popular open-source computer operating system, and a form of Linux.

### Programming languages use in linux Operating system

- Python — general purpose programming language
- PHP — scripting language suited for the websites

### Server software Use In Linux Operating System

- WordPress — blog software
- MediaWiki — wiki server software, the software that runs Wikipedia
- Joomla - a website software
- MongoDB — document-oriented, non-relational database
- Moodle — course management system or virtual learning environment
- Drupal — content management system
- RenovatioCMS — content management system
- Apache — HTTP web server

### Open Source Software

The DOS and Windows are the proprietary software of Microsoft. Then, we have thousands of Open source software (OSS). The OSS has its underlying 'sourcecode' made available under a license, so that the developers and users are **allowed to adapt and improve it**. Most popular licensing system is GNU General Public License (GNU GPL, or GPL). Under GNU GPL, the licensees may not 'close' versions. The licensee may modify copy and redistribute any derivative version, under the same GPL license. The licensee can either charge a fee for this service or work free of charge. Please note that Open source doesn't just mean access to the source code. The distribution terms of open-source software must comply with the following criteria:

1. Free Redistribution: No restriction on any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources.
2. Source Code: The program must include source code, and must allow distribution in source code as well as compiled form.
3. Derived Works: The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.
4. Integrity of The Author's Source Code: The license may restrict source-code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

5. No Discrimination Against Persons or Groups: The license must not discriminate against any person or group of persons.
6. No Discrimination Against Fields of Endeavor: The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.
7. Distribution of License: The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.
8. License Must Not Be Specific to a Product: The rights attached to the program must not depend on the program's being part of a particular software distribution.
9. License Must Not Restrict Other Software: The license must not place restrictions on other software that is distributed along with the licensed software.
10. License Must Be Technology-Neutral: No provision of the license may be predicated on any individual technology or style of interface.

## **DOS and WINDOWS**

DOS stands for disk operating system. The most prevalent form of DOS was manufactured by Microsoft. The last version of DOS to be marketed separately was 6.22 and was used in conjunction with windows 3.11 windows 95 includes DOS. The main difference between windows and DOS is the ability to "multitask" or use two or more programs or data files simultaneously. In these programmes we have directories or folders that work like a filing cabinet. They help keep our hard disk organized by keeping system files together or program files together and separate from data files. Some types of files include executable or from data files. Some types of files include executable or program files (file names end in .exe) dynamic link libraries (.dll) which are called upon by programs to do routines, and initialization files (.ini) which are used by certain programs to store startup settings.

The earliest avatar of Microsoft Windows was Interface Manager, which was being developed in September 1981. The first ever version of Windows operating system was announced on November 10, 1983. It was an extension of MS DOS, and sported a graphic user interface. Windows 1.0 was finally released into market in November, 1985.

## **Software**

The computer programme which contains the instructions to make the hardware work are called software. There are two primary software categories viz. Operating Systems or System Software and Application Software.

Operating System handles the essential task such as maintaining file system and coordination of data and memory with CPU, external devices and output devices. Operating System is needed to give a platform for the applications to run. Thus, we can say that Operating Systems would control the execution of instructions in the CPU of the computer, but it is the applications that perform specific tasks of interest to end users. For example Windows is an operating system and Microsoft Word is an application.

Then we have network software, which enable groups of computers to communicate, and language software which provides programmers with the tools they need to write programs. They are neither system nor application software but have the elements of both of them. Then we have Proprietary software, sharewares and freeware. The Proprietary software is the so-called packaged software which are developed and sold primarily online or offline via computer shops. The freeware and public-domain software are made available without cost. The sharewares are

also freeware but carries a small fee for those who wish to use it. Shareware may be proprietary software that is provided to users without payment on a trial basis and is often limited by any combination of functionality, availability, or convenience.

### **What are Beta testing and Alpha testing?**

Software testing is to test a software or software code to find bugs and errors. There are basically of two types: alpha testing and beta testing. The first is done at the developer end, while the second is at the user end. A beta tester is the customer itself and notes down defects and reports them to the developer. The user/ customer is called a 'beta tester' because he is the second one to carry out the testing. The term is derived from the fact that beta comes after alpha in the Greek alphabet.

### **World's First Software**

Ada Lovelace wrote a rudimentary programme for the analytical machine designed by Charles Babbage in 1827, but the machine never became operational. In 1949, the language short code appeared. It was the first computer language for electronic devices and required the programmer to change its statements into 0s and 1s by hand.

### **Working of Touchscreen Monitors**

In Touchscreen Monitors, we can use our finger on the computer screen to navigate through the contents. This type of screens is most commonly visible in Public Information Kiosks and ATMs. The touch screen has 3 main components as follows:

- **A Touch sensor:** It's a textured coating across the glass face. This coating is sensitive to pressure and registers the location of the user's finger when it touches the screen.
- **A controller:** It is a small PC card that connects the touch sensor to the PC. It takes information from the touch sensor and translates it into information that PC can understand.
- **A Software driver:** Software Driver is a software update for the PC system that allows the touchscreen and computer to work together. It tells the computer's operating system how to interpret the touch event information that is sent from the controller.

Please note that the touch screen monitor is an input device and it needs to be combined with a display and a PC to make a complete touch input system.

There are 3 basic systems used to recognize a person's touch.

1. **Resistive :** The resistive system consists of a normal glass panel that is covered with a conductive and a resistive metallic layer. These layers are held apart by spacers, and a scratch-resistant layer is placed on top of the whole set up. An electrical current runs through the two layers while the monitor is operational. When a user touches the screen, the two layers make contact in that spot. The change in electrical field is noted and coordinates of the point of contact are calculated. Once the coordinates are known, a special driver translates the touch into something that the operating system can understand, much as a computer mouse driver translates a mouse's movements into a click or drag.
2. **Capacitive:** In the capacitive system, a layer that stores electrical charge is placed on the glass panel of the monitor. When a user touches the monitor with his or her finger, some of the charge is transferred to the user, so the charge on the capacitive layer decreases.

This decrease is measured in circuits located at each corner of the monitor. The computer calculates, from the relative differences in charge at each corner, exactly where the touch event took place and then relays that information to the touch screen driver software. One advantage of the capacitive system is that it transmits almost 90 per cent of the light from the monitor, whereas the resistive system only transmits about 75 per cent. This gives the capacitive system a much clearer picture than the resistive system.

3. **Surface acoustic wave:** The surface acoustic wave system uses two transducers (one receiving and one sending) placed along the x and y axes of the monitor's glass plate. Also placed on the glass are reflectors — they reflect an electrical signal sent from one transducer to the other. The receiving transducer is able to tell if the wave has been disturbed by a touch event at any instant, and can locate it accordingly. The wave setup has no metallic layers on the screen, allowing for 100-percent light throughput and perfect image clarity. This makes the surface acoustic wave system best for displaying detailed graphics (both other systems have significant degradation in clarity).

Another area in which the systems differ is which stimuli will register as a touch event. A resistive system registers a touch as long as the two layers make contact, which means that it doesn't matter if you touch it with your finger or a rubber ball. A capacitive system, on the other hand, must have a conductive input, usually your finger, in order to register a touch. The surface acoustic wave system works much like the resistive system, allowing a touch with almost any object — except hard and small objects like a pen tip.

## Types of Computer Monitors

### Monitor

Monitor or visual display unit is the most common output device of a computer. It comprises a display device, circuitry, and an enclosure. The display device in modern monitors is typically a thin film transistor liquid crystal display (TFT-LCD) thin panel, while older monitors use a cathode ray tube about as deep as the screen size. The primitive monitors used the Cathode Ray Tubes (CRTs), until they were replaced by LCD monitors.

A cable connects the monitor to a video adapter (video card) that is installed in an expansion slot on the computer's motherboard. This system converts signals into text and pictures and displays them on Monitor. The computer sends a single to the video adapter, telling it what character, image, or graphic to display. The video adapter converts that signal to a set of instructions that tell the display device (monitor) how to the image on the screen.

We need to understand separate concepts to understand how a Monitor works:

### Cathode Ray Tube

Cathode Ray Tube (CRT) was invented by German physicist Karl Ferdinand Braun in 1897. It is the device that was long used in most computer displays, video monitors, televisions radar displays and oscilloscopes. The CRT has undergone numerous development until the advent of plasma screens, LCD , TVs, DLP, OLED displays, and other technologies. Technically, CRT has an electronic vacuum tube employing a focused beam of electrons.

### Pixels

That most common type of graphics monitors employing a cathode ray tube are the raster-scan display based on television technology. In such a system, the Electron beam is swept across the screen, one row at a time from top to bottom. As this beam moves across each row, the beam intensity is turned on and off. This would create a pattern of illuminated spots.

There is a memory area called refresh buffer or frame buffer where the picture definition is stored. This memory area holds the set of intensity values for all the screen points. These stored intensity values are then retrieved from the refresh buffer and “painted” on the screen one row (scan line) at a time. Such each screen point is referred to as a ‘pixel’ or pel (shortened forms of picture elements). The capability of a raster-scan system to store intensity information for each pixel makes it well suited for the realistic display of scenes containing subtle shading and colour patterns.

### **LCD TFT Display**

Liquid Crystal Display television (LCD TV) is television that uses LCD technology for its visual output. The technology used is generally TFT. TFT refers to a Thin Film Transistor, which is a special kind of field effect transistor made by depositing thin films for the metallic contacts, semiconductor active layer, and dielectric layer. The channel region of a TFT is a thin film that is deposited onto a substrate (often glass, since the primary application of TFT is in liquid crystal displays).

LCD panels are made of two layers of transparent material, which are polarized, and are “glued” together. One of the layers is coated with a special polymer that holds the individual liquid crystals. Current is then passed through individual crystals, which allow the crystals to pass or block light to create images. LCD crystals do not produce their own light, so an external light source, such as florescent bulb is needed for the image created by the LCD to become visible to the viewer. Thus, **LCDs use a strong backlight as the light source and control how much of this light is allowed to reach the pixels by selectively allowing the light to reach each pixel.** LCDs achieve this by taking advantage of a key property of ‘twisted’ liquid crystal molecules, which have the ability to naturally block polarized light but then let it through by degrees when a small electric field is applied. LCD cells are accurately controlled and arranged in a flat matrix of rows and columns.

### **Plasma Display Panel**

We have read above that LCD crystals do not produce their own light, so an external light source, such as florescent bulb is needed for the image created by the LCD to become visible to the viewer. The Plasma television technology is absolutely different from this. The Plasma Display Panel is based loosely on the fluorescent light bulb. The display itself consists of very microscopic cells and within each cell two glass panels are separated by a narrow gap in which neon-xenon gas is injected and sealed in plasma form. Gas is electrically charged at specific intervals and then strikes red, green, and blue phosphors, thus creating a television image. Each group of red, green, and blue phosphors is called a pixel (picture element).

Due to presence of its own source of light, PDP suffers from the issues such as **heat generation and screen-burn of static images.**

### **Why are screensavers used in computers?**

Screensavers are designed to prevent phosphor burn-in on CRT and plasma computer monitors by blanking the screen or filling it with moving images or patterns when the computer is not in use are programs that display images when the computer is idle for a specified time. In early CRT monitors when the same image would be displayed for a long time, the phosphors used to make the pixels in the display glow at a constant rate for so long a period that they would discolor the glass surface of the CRT.

But now, the advances in display technology and energy-saver monitors have solved this problem. So now we use screensavers for entertainment or security and they are perceived as works of art and used to prevent others from viewing confidential data when the user is away.

Thus, we note that Plasma display panel (PDP) is an emissive flat panel display where visible light is created by phosphors excited by a plasma discharge between two flat panels of glass. The **gas discharge contains no mercury (contrary to the backlights of an active matrix LCD)**, an inert mixture of noble gases (neon and xenon) is used instead.

### **Dead Pixels, Hot Pixel, Stuck Pixel**

A dead pixel is a defective pixel that remains unlit on an LCD screen, monitor, camera, charge-coupled device or CMOS sensor. A permanently lit pixel is a hot pixel, and a pixel that stays on a solid colour is a stuck pixel. Dead pixels can also occur in clusters and these are particularly annoying and in most cases these can be sent back to the manufacturer. The majority of dead pixels are only noticeable on a solid colour background, for example through the use of the "Dead Pixel Checkers" which consist of four-five solid-colour images.

### **EFT monitors**

All types of monitors are a strain on our eyes. EFT, or Eye Fresh Technology, monitors have a vital coating on the rear that emits anions and far-infrared rays that serve to make the environment fresh and ease the strain on the eyes and relax the eyes and body

### **Blu Ray Disc**

Blu-ray is currently supported by about 200 of the world's leading consumer electronics, personal computer, recording media, video game and music companies. Blu-ray, also known as Blu-ray Disc is the name of a next-generation optical disc format that has been jointly developed by the Blu-ray Disc Association (BOA). Blu-ray Disc association is a group of world's leading consumer electronics, personal computer and media companies. The format also has support from all Hollywood studios and countless smaller studios as a successor to today's Digital Visual Disk format. It was initially launched as "Blu-ray Disc founder group" in 2002 by MIT and nine leading electronic companies: Sony, Panasonic, Pioneer, Philips, Thomson, LG Electronics, Hitachi, Sharp, and Samsung.

### **Why Blue, why not magenta or orange?**

We have studied above that Digital Visual Disk uses 650 nm (red) wavelength laser diode light as opposed to 780 nm for Compact Disk (infra red). Blu-ray Disc uses a wavelength of 405 nm, that is coming in the violet (blue) region of electromagnetic spectrum and that is why this term is used. Blu Ray disc was developed for the following purposes:

1. Storing larger amounts of data.
2. Enable recording, rewriting and playback of high-definition video (HD)

So, the Blu Ray Disk offers more than five times the storage capacity of traditional Digital Visual Disk's and can hold up to 25GB on a single-layer disc and 50GB on a dual-layer disc. The benefit of using a blue violet laser (405nm) is that it has a shorter wavelength than a red laser (650nm), which makes it possible to focus the laser spot with even greater precision, leading to the packing of data more tightly and stored in less space. The dimension of the Blu Ray disc is same as that of a

## Compact Disk or Digital Visual Disk.

But the HD Digital Visual Disk was also developed as an answer to the Blu ray Discs. This would also succeed the normal Digital Visual Disk. The HD Digital Visual Disk as well as Blu Ray Disc have a single-layer capacity of 15 GB and a dual-layer capacity of 30 GB, while the the HD Digital Visual Disk-Random Access Memory has a single-layer capacity of 20 GB and a dual-layer capacity of 40 GB. The data layer of HD Digital Visual Disk is 0.6 mm below the surface physically protecting the data layer from damage.

### **Digital Versatile Disc (DVD)**

Digital Video Disc or Digital Versatile Disc (DVD) is also an optical storage device that looks the same as a compact disc but is able to hold about 15 times as much information and transfer it to the computer about 20 times as fast as a CDROM. The CD and DVD have the same dimensions.

DVDs come in two formats: the DVD-Video and the DVD-ROM (DVD Read Only Memory) format. The DVD-Video format is used for home movie entertainment through a DVD player.

### **Why DVD stores more data than CD?**

Please note that DVD uses 650 nm (red) wavelength laser diode light as opposed to 780 nm for CD (infra red). This permits a smaller pit to be etched on the media surface compared to CDs (0.74  $\mu\text{m}$  for DVD versus 1.6  $\mu\text{m}$  for CD), allowing in part for DVD's increased storage capacity. Further, the Blu-ray Disc, the successor to the DVD format, uses a wavelength of 405 nm, and one dual-layer disc has a 50 GB storage capacity. So basically, it is the laser optics that matters in storage capacities of various kinds of Discs.

### **Compact Discs (CD)**

Compact Disc (CD) is made of several layers of a type of plastic usually **Polycarbonates**. The outer layers are protection layers, which simply absorb scratches so that the inner layer holding data remains intact. The inner data layer has small tracks which spiral out from the centre of the disc towards the ends. These tracks are such tightly wound that the entire length of the track if stretched out in a straight line would stretch over five kilometers.

Data is written to the CD-ROM by burning microscopic pits into the reflective surface of the disk with a powerful laser. These spiral tracks have flat reflective areas and non-reflective bumps. A flat reflective area represents a binary 1, while a non-reflective bump represents a binary 0. The data is stored in a spiral pattern that originates from the centre of the disc and spirals out toward the outer edge.

Data is read from a CD-ROM with a low power laser contained in the drive that reflects **infrared light** off of the reflective surface of the disk and back to a photo detector. The pits in the reflective layer of the disk scatter light, while the land portions of the disk reflect the laser light to the photo detector. The photo detector then converts these light and dark spots to electrical impulses corresponding bits. Electronics and software interpret this data and accurately access the information contained on the CD-ROM. A standard 74 min. CD contains 333,000 blocks and each block is 2,352 bytes.

Thus, with proper devices and software, one can record and read the data from a CD ROM. It's worth note that CDROM is manufactured with an organic dye layer that is permanently changes by

the laser of the recorder in a pattern that represents the bits and bytes of the data. These are called Write once discs. On the other hand, CD-RW (CD-read/write) are discs, which can be erased and re-recorded with data.

Please note that underside of the CD-ROM disk is coated with a very thin layer of **aluminum** that reflects light

### **Hard Disk of a Computer**

The hard disk is an internal storage device which holds programs and data used by a computer. It consists of magnetic platters with read/write heads that float above the platters to record and play back data. In many respects, it is similar to a phonograph turntable. It is susceptible to strong jarring, which could cause the heads to physically damage the disk. The disk is enclosing in an airtight casing to keep it dust-free. HDD is a non-volatile, random access digital data storage device, which was first introduced by IBM in 1956.

The Microsoft Operating Systems allow a drive letter assignment such as C Drive, D Drive, E Drive etc. . This is the process of assigning alphabetical identifiers to physical or logical disk drives or partitions (drive volumes) in the root file system namespace.

### **Why there is no B drive?**

It's not that computers don't have B drives. We should be aware that the primitive personal computers didn't have hard discs. They were equipped with two floppy drives called drives A and B. Later, a hard disk was introduced and was labeled as the C drive. Other drives like the CD drive, DVD drive, flash drive and others were labeled D, E, F,G, H etc.

The basic question here arrives that how does computer write information to the hard disk. Please note that unlike a cassette, a computer writes information to the hard disk in a sequential manner. This means that one file's a data may be scattered around the disk. When files are deleted, or even edited, blank spaces may appear around the disk.

### **Can a computer have more than one hard disk?**

Yes. We use usually two kinds of Hard Disks today. IDE (Integrated Drive Electronics) and SCSI (Small Computer System Interface) hard drives. The IDE drives are used in PCs and SCSI in servers. Motherboards usually come with two embedded IDE ports. Each port can have two devices connected to it on the same data cable for a total of four devices. CD and DVD units are also connected to the IDE ports and counted as one of those four devices. Once we have four devices, then we can add a PCI IDE controller to have more ports to add devices. SCSI hard drives are connected to a PCI SCSI controller that will be able to accept seven devices for standard SCSI and 15 for the newer, wide SCSI.

### **Data Storage in a Computer**

The area within a computer system where data can be left on a longer term basis while it is not needed for processing is called "Data storage" . The mass storage devices include the diskettes, Hard Drives, Optical Disks and Magnetic Tapes. Diskette is a small, removable, flexible plastic disk covered with a thin layer of a magnetisable substance, onto which digital data can be recorded and stored. They are called Floppy Disks and now they are outdated. The Hard Drive is the storage area within the computer itself, where gigabytes of space are available to store bits of information.



Then, we have the Optical Disks, which is a storage device that uses reflecting surfaces and laser technology to read and write data on a disk, so also known as Laser Disk. CD-ROM's are the most popular type of optical storage. CD-ROM stands for Compact Disc Read Only Memory. A computer CD-ROM disk, like its audio counterpart, contains data that has been stamped on the disk surface as a series of pits. To read the data on a CD-ROM an optical read head distinguishes the patterns of pits that represent bytes. CD-ROM disks provide tremendous storage capacity. CD-ROMs usually come with data already written onto them. These days most applications software is provided on CD-ROM.

## Computer Mouse

A mouse is a handheld device for moving the pointer around the screen. It is a primary component of the windows **GUI (Graphical User Interface)** environment. The use of the mouse in windows allows the user to point at and clicks on various icons for programs and data files rather than having to type in commands to copy files, open programs, etc. as in the older DOS.

Mouse is invention of Douglas Carl Engelbart. **Douglas Carl Engelbart** is an American inventor and early computer pioneer and internet pioneer, best known for inventing the Computer Mouse.

Apart from the mouse, his team also developed the hypertext, networked computers, and precursors to GUIs.

A typical Mouse consists of two buttons, each of which functions differently in windows. A single click of the left button on an icon selects the item, a double click (clicking twice in rapid succession) button will open a pop-up menu offering choices relative to the item clicked. The primitive mouse did not contain the roller. Now the IntelliMouse includes a roller between the two buttons for easy scrolling up and down, specially while visiting websites. The early mouse contained the touchpad's, large and small trackballs, and graphics tablets.

Here we should note that almost all functions that we do with a mouse can be replaced with keyboard commands. The keyboard equivalents are visible in the menus in most programmes.

## What is Computer Keyboard

The standard microcomputer keyboard consists of 104 keys arranged in the standard typewriter or QWERTY layout. A separate numeric keypad is at the right side of the keyboard and can be toggled on or off by pressing the "num lock" key. This numeric keypad may not be found in small size laptops and keyboards.

**QWERTY** comes from the first six letters in the top row. It was invented by **C L Sholes** in 1872.

## Keyboard v/s Game Console

Here we can note that the primary device for the PC is a keyboard and mouse, while all Game console systems come with game pads used to control movement within the game. Technically, a computer game can be thought of as one composed of a computer-controlled virtual universe. A video game is a computer game where a video display is the primary feedback, which is displayed on a television screen. It is the console system that takes advantage of the plug-and-play feature — there is no need to install the software or get different graphic cards, faster processors or CPU chips.

## Flash Memory

Flash memory is a form of non-volatile computer memory that can be electrically erased and reprogrammed. Flash memory applications include digital audio players, digital cameras and mobile phones. Flash memory is also used in USB flash drives (Thumb drives, handy drive), which are used for general storage and transfer of data between computers. It has also gained some popularity in the gaming market, where it is often of EEPROM or battery-powered SRAM for game save data.

## SDRAM & DDR SDRAM

Synchronous dynamic random access memory (SDRAM) is DRAM that is synchronized with the system bus. DRAM has an asynchronous interface, which means that it responds as quickly as possible to changes in control inputs. SDRAM has a synchronous interface, meaning that it waits for a clock signal before responding to control inputs and is therefore synchronized with the computer's system bus. The clock is used to drive an internal finite state machine that pipelines incoming instructions. This allows the chip to have a more complex pattern of operation than an asynchronous DRAM, enabling higher speeds.

Double data rate (DDR) SDRAM was a later development of SDRAM, used in PC memory beginning in 2000. DDR2 SDRAM was originally seen as a minor enhancement (Based upon the industry standard single-core CPU) on DDR SDRAM that mainly afforded higher clock speeds and somewhat deeper pipelining. However, with the introduction and rapid acceptance of the multi-core CPU in 2006, it is generally expected in the industry that DDR2 will revolutionize the existing physical DDR-SDRAM standard. Further, with the development and anticipated introduction of DDR3 in 2007, it is anticipated DDR3 will rapidly replace the more limited DDR and Newer DDR2.

## SRAM v/s DRAM v/s VRAM

Dynamic Random Access Memory (**DRAM**) is a type of random access memory that stores each bit of data in a separate capacitor within an integrated circuit. Since real capacitors leak charge, the information eventually fades unless the capacitor charge is refreshed periodically. Because of this refresh requirement, it is a dynamic memory as opposed to SRAM and other static memory. Its advantage over **SRAM** is its structural simplicity; only one transistor and a capacitor are required per bit, compared to six transistors in SRAM.

This allows **DRAM** to reach very high density. Since DRAM loses its data when the power supply is removed, it is in the class of volatile memory devices. **VRAM** is a dual-ported version of DRAM formerly used in graphics adaptors. It is now almost obsolete, having been superseded by SDRAM and SGRAM. VRAM has two paths (or ports) to its memory array that can be used simultaneously.

## RAM v/s ROM and Primary Storage

RAM is also volatile, losing the stored information in an event of power loss, and quite expensive. ROM is not volatile, but is not suited to storage of large quantities of data because it is expensive to produce. Primary Storage is also known as internal memory. It is the computer memory that is accessible to the CPU of a computer without the use of computer's input/output channels. Primary storage is used to store that is likely to be in active use. Primary storage is typically very fast, as in the case of RAM. But, ROM must also be completely erased before it not impossible. Therefore, separate secondary storage, or external memory, is usually required for long-term persistent storage. Primary storage may include several types of storage, such as main storage, cache memory, and special registers, all of which can be directly accessed randomly, that is, accessing

any location in storage at any moment takes the same amount of time.

## ROM v/s RAM

Read-only memory (ROM) is a class of storage media used in computers and other electronic devices. It's easily cannot be written to, its main use lie in the distribution of software. Some ROMs can be erased and re-programmed multiple times, although they are still referred to as "read only" because the reprogramming process involves relatively infrequent, complete erasure and reprogramming, not the frequent, bit-or word at a time updating that is possible with RAM.

Random access memory (RAM) is a type of data store used in computers that allows the stored data to be accessed in any order-that is, at random, not just in sequence. Generally RAM in a computer is considered main memory or primary storage; the working area and data. This type of RAM is usually in the form of integrated circuits (ICs). These are commonly called memory sticks or RAM sticks because they are manufactured as small circuit boards with plastic packaging personal computers have slots for adding and replacing memory sticks. Most RAM can be both written to and read from, so "RAM" can both written to and read from, so "RAM" is often used interchangeably with "read-write memory". In this sense , RAM is he "opposite" of ROM, but in a more true sense, of sequential access.

## PROM, FEPROM and ROM

- A programmable read-only memory (PROM) or field programmable read-only memory (FEPROM) is a form of digital memory where the setting of each bit is locked by a fuse or antifuse. Such PROMs are used to store programs permanently. They are most commonly seen in computer games or such products as electronic dictionaries, where PROMs for different languages can be substituted. Common PROM comes with all bites reading as 1. Burning a fuse during programming causes its bit to read as 0. The memory can be programmed just once after manufacturing by "blowing" the fuses (using a PROM blower), which is an irreversible process. Blowing a fuse opens a connection while blowing an antifuse closes a connection. Programming is done by applying high-voltage pulses which are not encountered during normal operation (typically 12 to 21 volts).
- Read-only means that, unlike the case with conventional memory, the programming cannot be changed (at least not by the end user).

## Random Access Memory (RAM)

**RAM** is an acronym for **random access memory**, a type of computer memory that can be accessed randomly. that is, any byte of memory can be accessed without touching the preceding bytes.A Computer Memory refers to the temporary internal storage areas within a computer. The term memory is usually used as shorthand for 'physical memory', which refers to the actual chips capable of holding data. Some computers also use 'virtual memory', which expands physical memory onto a hard drive.

The main type of memory and the most familiar to users is random access memory (RAM). Random Access Memory is the same as main memory. A computer can both write data into Random Access Memory and read data from Random Access Memory.

Any time we turn on a computer, a set of operating instructions is copied from the hard disk into Random Access Memory. These instructions, which help control basic computer functions, remain in RAM until the computer is turned off. Most Random Access Memory is volatile, which means that it requires a steady flow of electricity to maintain its contents. As soon as the power is turned

off, whatever data was in RAM disappears. The contents of RAM are necessary for the computer to process data. The results of the processing are kept temporarily in RAM until they are needed again or until they are saved onto the hard disk or other storage device.

Storage capacity of Random Access Memory is measured in megabytes (MB) and Giga Bytes (GBs). A 64 MB Random Access Memory means that it can hold 64 million bytes of data (a standard A4 page of text typically holds about 2,048 bytes or characters of text). Other types of memory include.

### Bytes v/s Octets v/s Nibble

The term byte initially meant the smallest addressable unit of memory. In the past, 5-,6-,7-,8-, and 9-bit bytes have all been individual bits (bit-addressed machine) or that could only address 16-or 32-bit quantities (bit-addressed machine).The term byte was usually not used at all in connection with bit- and word-addressed machines. However, term octet always refers to an 8-bit quantity. Today, it mostly used in the field of computer networking, where computers with different bytes widths might have to communicate.

A nibble is a four-bit aggregation, or half an octet. As a nibble contains 4 bits, there are sixteen (2<sup>4</sup>) possible values, so a nibble corresponds to a single hexadecimal digit (thus, it is often referred to as a “hex digit” or “hexit”

### Understanding Bits and Bytes

A bit refers to binary digit. It refers to a digit in the binary numeral system, which consists of base 2 digits (**i.e. there are only 2 possible values; 0 or 1**).

This means that the number **10010111 is 8 bits long**. Thus Bit is used as a variable or computed quantity that can have only two possible values. These two values are often interpreted as binary digits and are usually denoted by the Arabic numerical digits 0 and 1. Binary digits are almost always used as the basic unit of information storage and communication in digital computing and digital information theory. The bit is also a unit of measurement, the information capacity of one binary digit.

There are several units of information which are defined as multiples of bits, **such as byte (8 bits), kilobit (either 1000 or 2<sup>10</sup> = 1024 bits)**.

A kilobyte is a unit of information or computer storage equal to either 1024 or 100 bytes. It commonly abbreviate as Kb, KB or Kbyte. The term “kilobyte” was first used to refer to a value of 1024 bytes (2<sup>10</sup>), because the binary nature of digital computers lends itself to quantities that are powers of two, and 2<sup>10</sup> is roughly one thousand. This misuse of the SI prefixes spread from the slang of computer professionals into the mainstream lexicon, creating much confusion, between the Kilo and Kilobyte.

A megabyte is a unit of information or computer storage equal to approximately one million bytes. It is commonly abbreviated MB. Mb is used for megabits. A gigabyte (**derived from the SI prefix giga**) is a unit of information or computer storage equal to one billion (that is, a thousand million)bytes.

**1,073,741,824 bytes, equal to 1024<sup>3</sup>, or 2<sup>30</sup> bytes**. This is the definition used for computer memory sizes, and most often used in computer engineering, computer science, and most aspects

of computer operating systems. **The IEC recommends that this unit should instead be called a gibibyte** (abbreviated GiB), as it conflicts with SI units for bus speeds and the like

### Complementary Metal Oxide Semiconductor (CMOS)

- CMOS is an abbreviation for **Complementary Metal Oxide Semiconductor**. CMOS technology is used in microprocessors, microcontrollers, static RAM, and other digital logic circuits. CMOS technology is also used for several analog circuits such as image sensors (CMOS sensor), data converters, and highly integrated transceivers for many types of communication.
- **CMOS uses** a complimentary arrangement of NMOS and PMOS, Negative And Positive Metal Oxide Transmitter Circuits. CMOS memory draws very little current (Nano-amps). Values stored in it can be maintained for very a long period of time while the computer is off with a rechargeable lithium battery. The CMOS memory is used to store system configuration information, such as disk drive parameters, memory configuration and setup program.
- **CMOS memory** is used by the basic input output system (BIOS), a program permanently stored in the flash memory as disk drive parameters, memory configuration, and the date-time, some of which we enter in the CMOS setup program. CMOS setup is part of the BIOS program.
- **The CMOS memory** is usually located with the real-time clock in the motherboard chipset or in a separate real-time clock chip. It is located in the chipset on most recent motherboards.

### What is difference between Cold Boot and Warm Boot?

We actually perform a Cold Boot every time we turn on the power switch of our computer. To “boot” the computer means to start it up and reset the memory and BIOS. Sometimes, the programme running hangs and we press the ctrl-alt-delete keys simultaneously. This is called Warm Boot. So, when a computer stops responding because of memory problems or the “blue screen of death” appears, we need to do a warm boot. The latest operating system Windows 7 responds with task manager when we press the ctrl-alt-delete keys simultaneously. We can choose the not responding programmes to close and continue. However, if the warm boot fails to restart the computer, we need to resort to a cold boot by shutting off the power switch, waiting few seconds and then turning it back on.

### Basic Input/Output System (BIOS)

- **BIOS** refers to **basic input/output system** (BIOS). BIOS software is built into the PC, and is the first code run by a PC when powered on, and that is why it is called **boot firmware**.
- In computing, **firmware is software that is embedded in a hardware device**. It is often provided on flash ROM or as a binary image file that can be uploaded onto existing hardware by a user. When we turn on the power switch, computer will make some beeps while it goes through a self-check of the system components. If we want to change any of the setup options, such as setting a password for the system, changing the sequence for booting up the computer, or reconfiguring any other hardware, we need to press the F2 or any other key recommended by the hardware provider to access the key **BIOS settings**. The BIOS includes very basic information about the hardware to get the computer started before the operating system software takes over. Once the operating system takes over, more detailed information about the hardware is loaded into the computer’s RAM and windows starts up.

- Thus, **primary function of the BIOS is to set up the hardware and load and start an operating system.** When the PC starts up, the first job for the BIOS is to initialize and identify system devices such as the video display card, keyboard and mouse, hard disk drive, optical disc drive and other hardware. The BIOS then locates software held on a peripheral device ('boot device'), such as a hard disk or a CD/DVD, and loads and executes that software, giving it control of the PC. This process is known as **booting**. Booting is synonymous with a booting up, which is short for **bootstrapping**.

## Computer Port

A hardware computer port is a physical interface between a computer and other computers or devices. A software computer port is a virtual data connection between computer programs possibly through a computer network.

The Hardware ports come in different sizes such as round, rectangular, square, trapezoidal etc. They can be serial ports or parallel ports. The difference between them is in sending and receiving bits. Serial ports send and receive one bit at a time via a single wire pair (Ground and +/-) Parallel ports send multiple bits at the same time over several sets of wires. A parallel port is also referred to as the printer port since that is usually the device that plugs into it. Many other peripherals have been created to use the parallel port including external CD-ROM drives and ZIP drives. While plugging these devices into the parallel port makes them extremely easy to set up.

A COM Port stands for communications port and is also referred to as a serial port. Most initial computers have at least four COM ports internally which modems or other internal peripherals see. every computer has at least one and usually two external COM ports for physically attaching external peripheral devices, such as external modems, scanners, and digital cameras.

USB stands for universal serial Bus and is a common component on new computers. The port looks like a flat slot and there are usually two of them together. More than 120 devices in new computer peripherals (digital cameras, scanners, speakers) come with USB adapters that allow the user to plug the unit into the computer and use it immediately without having to install expansion cards inside the computer and make manual adjustments to the computer settings. These are also called Plug-and-play ports. They are such that once they are in used; the connected devices start handshaking automatically. USB Ports are typical examples of the plug-and-play. For Example, in a USB port, you can plug a USB Drive, USB Mouse, USB Keyboard etc. and the devices are detected automatically.

## What is Motherboard in Computer?

- A motherboard is the major, underlying circuit board of a computer. The CPU, RAM and various disk or optical drives are all plugged into interfaces on it. A video interface and sound card can also be built-in or added, and additional connections are used by peripherals and various devices.
- The Central Processing Unit is housed in the motherboard, which connections that allow the various components to communicate with each other. The motherboard must have a socket for at least one Central Processing Unit chip, and sockets for typically 2 or 4 memory "sticks". The back panel has plugs for keyboard, mouse, Universal Serial Bus (USB), Ethernet, and external disks. Motherboards have integrated video and audio. It also has many slots and connectors
- The motherboard is the main circuit board of the computer and as such acts as the "circulation system" of the computer. All signals used by the computer are processed by

the motherboard. Memory chips, the central processor, expansion boards and cables to disk drives all attach to the motherboard.

- A motherboard is very much like a city with many apartments, hotels etc. each using power from a common electrical system. Multiple lane highways of various widths transport data between the buildings. Thus, a motherboard is the data and power infrastructure for the entire computer. It's a Printed Circuit Board (PCB) that contains and controls the components that are responsible for processing data. The major components of a motherboard include the Central Processing Unit (CPU), memory and basic controllers for the system.

### **Central Processing Unit (CPU)**

A general purpose computer has four main sections: the arithmetic and logic unit (ALU), the control unit, the memory, and the input and output devices (collectively termed I/O). These parts are interconnected by busses, often made of groups of wires. The control unit, ALU, registers, and basic I/O (and often other hardware closely linked with these) is collectively known as a **Central Processing Unit (CPU)**.

Primitive CPUs were comprised of many separate components but since the mid-1970s CPUs have typically been constructed on a single integrated circuit called a microprocessor. CPU plays a role analogous to the brain in the computer.

The CPU can be a single chip or a series of chips that perform arithmetic and logical calculations and that time and control the operations of the other elements of the system. It was the contribution of the miniaturization and integration techniques that made possible the development of the microprocessor. A Microprocessor is a CPU chip that incorporates additional circuitry and memory. Typical CPU chips and microprocessors are composed of four functional sections:

1. **Arithmetic/logic unit (ALU):** gives the chip its calculating ability and permits arithmetical and logical operations
2. **Registers:** The registers are temporary storage areas that hold data, keep track of instructions and hold the location and results of these operations.
3. **Control section:** The control section times and regulates the operations of the entire computer system; its instruction decoder reads the patterns of data in a designated register and translates the pattern into an activity, such as adding or comparing; and its interrupt unit indicates the order in which individual operations use the CPU and regulates the amount of CPU time that each operation may consume.
4. **An internal bus:** It's a network of communication lines that connect the internal elements of the processor and also leads to external connectors that link the processor to the other elements of the computer system.

### **The CPU Buses are of three types:**

1. Control bus consisting of a line that senses input signals and another line that generates control signals from within the CPU
2. Address bus that is one-way line from the processor that handles the location of data in memory addresses
3. Database, which is a two-way transfer line that both reads data from memory and writes new data into memory.

### **Dual Core and Quad Core**

Development of multi-core processors is one of the latest trends in the computer industry, because single core processors rapidly reach the physical limits of possible complexity and speed. A multi-core microprocessor is one that combines two or more independent processors into a single package, generally in a single integrated circuit (IC). A Dual Core is device that contains two independent microprocessors and a Quad-core device contains four microprocessors. Multi-core processor has enhanced performance, reduced power consumption, and more efficient simultaneous processing of multiple tasks.

### CPU Cache

A CPU cache is a cache used by the central processing unit of a computer to reduce the average time to access memory. The cache is a smaller, faster memory which stores copies of the data from the most frequently used main memory locations. As long as most memory accesses are to cached memory locations, the average latency of memory accesses will be closer to the cache latency than to the latency of main memory.

### Parts of a Computer

#### The principal characteristic of a computer are.

1. It responds to a specific set of instructions in a well-defined manner.
2. It can execute and prerecorded list of instructions.

#### All general-purpose computers need the following hardware components.

- **Memory:** Memory enables the computers to store, at least temporarily, data and programs.
- **Mass storage device:** Allows a computer to permanently retain large amounts of data. Common classic mass storage devices include disk drives and tape drives. The latest being the Hard Disks and USB mass storage devices.
- **Input device:** The most usual input devices are a keyboard and mouse. They are used to put in data and instructions to computer.
- **Output device:** The most usual output devices are display screens such as Monitor which are of several types now a days and a printer, or other device that lets us see what the computer has accomplished.
- **Central processing unit (CPU):** This can be called the heart or brain of the computer which actually executes the instructions.

However, they can be divided into several categories on the basis of cost and performance. We can classify the computers by their size and powers, though there is considerable overlap. On this basis computers may be a personal computer, a Laptop, a Palmtop, a Workstation, a Minicomputer, a Mainframe or a Supercomputer.

To work on a computer, we need an operating system. Operating system (OS) provides a set of functions needed and used by most applications, and provides the necessary linkages to control a computer's hardware.

The first computers did not have the operating systems and each program would have to have drivers for the video card, memory card, and other peripherals used. So, the evolution of the computer applications and their complexity led to the OS necessities. Operating System has the job of managing the computer hardware resources, and providing common services for execution of various application software. The operating system is the most important type of system



software in a computer system. Without an operating system, a user cannot run an application program on their computer, unless the application program is self booting.

### SSI, LSI, MSI, VLSI & ULSI

- In a large electronic circuit, there may be very large number of components and as a result the discrete assembly will occupy a very large space.
- They are formed by soldering which causes a problem of reliability.
- They were interesting economically because which they cost little more systems to be manufacture using smaller circuit boards, less assembly work, and a number of other b. Next development was of LSI. The development of LSI was driven by economic factors and each chip comprised tens of thousands of transistors. It was in 1970s, when LSI started getting manufactured in huge quantities.
- The first integrated circuits contained only a few transistors and so were called “small-scale integration (SSI). They used circuits containing transistors numbering in the tens. They were very crucial in development of early computers. SSI was followed by introduction of the devices which contained hundreds of transistors on each chip, and so were called “medium-scale integration (MSI).
- Microprocessor chips produced in 1994 contained more than three million transistors. ULSI refer to “ultra-large scale integration” and correspond to more than 1 million of transistors. However there is no qualitative leap between VLSI and ULSI, hence normally in technical texts the “VLSI” term cover ULSI.
- LSI was followed by VLSI where “very large-scale integration”(VLSI), with hundreds of thousands of transistors, and beyond were used and still being developed. It was for the first time that a CPU was fabricated on a single integrated circuit, to create a microprocessor. In 1986, with the introduction of first one megabit RAM chips, more than one million transistors were integrated.

### Integrated Circuits

A monolithic integrated circuit (IC) also known as microchip, silicon chip, computer chip or chip is basically a miniaturized electronic circuit that consists of mainly of semiconductor devices, as well as passive components. This circuit is manufactured in the surface of a thin substrate of semiconductor material. A hybrid integrated circuit is a miniaturized electronic circuit constructed of individual semiconductor devices, as well as passive components, bonded to a substrate or circuit board.

The integrated circuit was first conceived by a radar scientist, Geoffrey W.A. Dummer (born 1909), working for the royal radar establishment of the British ministry of defense, and published in Washington, D.C. on may 7, 1952. Dummer unsuccessfully attempted to build such a circuit in 1956.

The first integrated circuits were manufactured independently by two scientists; jack Kilby of Texas instruments filed a patent for a “solid circuit” made of germanium on February 6,1959. Kilby received patent 3261081, and U.S. patent 3434015. Robert Noyce of Fairchild semiconductor was awarded a patent for a more complex “Unitary circuit” made of silicon on April 25, 1961. Noyce credited Kurt lehovec isolation caused by the action of a biased p-n junction (the diode) as a key concept behind the IC.

Integrated circuits can be classified into analog, digital and mixed signal. Digital integrated circuits can contain anything from one to millions of logic gates, Flip-flops, multiplexers, and other circuits in a few square millimeters. The small size of these circuits allows high speed, low power

dissipation, and reduced manufacturing cost compared with board-level integration. These digital ICs, typically microprocessors, DSPs, and micro controllers work using binary mathematics to process “zero” signals.

Analog ICs, such as sensors, power management circuits, and operational amplifiers, work by processing continuous signals. They perform functions like amplification, active filtering, demodulation, mixing, etc. analog ICs ease the burden on circuit designers by having expertly designed analog circuits available instead of designing a difficult analog circuit from scratch.

ICs can also combine analog and digital circuits on a single chip to create functions such as A/D converters and D/A converters. Such circuits offer smaller size and lower cost, but must carefully account for signal interference.

## **Beginning of Computing**

### **Introduction**

We all know that a computer is an electric device and a programmable machine. The English mathematician, philosopher, inventor and mechanical engineer Charles Babbage (1791-1871) is known for originating the concept of a programmable computer and that is why he is called the “father of the computer”.

Babbage was the first person who invented first mechanical computer that eventually led to more complex computers. He devised a plan for a stored-program mechanical computer, using data modeled after the punched card templates in industrial (jacquard) looms.

The first electronic digital computer was the **ABC unit** by John V. Atanasoff and Clifford Berry in 1940 at Iowa State University. Several of its ideas were incorporated into the **ENIAC** (Electronic Numerical Integrator And Computer) which ran from 1945-1955 and is considered the **first functionally useful electronic digital computer**. **Universal Automatic Computer** (UNIVAC) was innovated in 1940s that led to the **first commercially successful computer**.

One of the earliest personal computers was the **Intellect 4** by Intel, using their first commercially produced microprocessor –the **four-bit 4004**. The Altair built by MITS was another first commercially successful personal computer. Bill gates and Paul Allen wrote Microsoft’s (then known as Microsoft) first software product for-“**BASIC for the Altair**”.

Then in 1983, came the TRS-80 that was Tandy Corporation’s desktop microcomputer model line, which became famous as one of the trendiest home computers. Its **TRS-80 Model 100** was an early portable computer introduced in 1983. It was one of the first notebook-style computers, or a **prototype of a laptop**, featuring a keyboard and LCD display, battery powered, in a package roughly the size and shape of notepad or large book. This model running on 4 AA batteries very soon got popular with newspaper reporters. Now writing stories from field was possible provided there was an internet connection.

### **Brain Computer Interface**

A brain computer interface refers to the exchange of data between the human mind and a computer. It has for long been the subject of study wherein brain signals can be used to operate a computer and no longer the stock stuff of science fiction where a person thinks of a command and the computer executes it. Earlier, implanted electrodes were used for this purpose. However, with recent advances in non-invasive technology, even these are not required and scientists are

working at using brain activity for computer operation. It would be particularly useful for the disabled.

The functioning of computers is primarily based on one thing that is their ability to determine whether a switch (gate) is open or closed. It can recognize whether it is on or off. But, it's the speed of this act which makes them so efficient. The speed which is now measured in megahertz and giga hertz trillions of cycles per second in the super computers. So, the data held in a computer in binary form, using the digits 0 and 1. By counting, comparing and manipulating these two digits in their various combinations according to a set of instructions held in its memory, computer is able to perform a variety of tasks.

### **What is utility computing?**

Utility computing is a service provisioning model in which a service provider makes computing resources and infrastructure management available to the customer as needed, and charges them for specific usage rather than a flat rate. Like other types of on-demand computing (such as grid computing), the utility model seeks to maximise the efficient use of resources and/ or minimize associated costs.

**{Part – II}**

## Computer Awareness Digest for IBPS PO & Clerk Exams

### Basics & Fundamentals of Computer

**Computer:** A **computer** is a truly amazing machine that performs a specified sequence of operations as per the set of instructions (known as **programs**) given on a set of data (**input**) to generate desired information (**output**).

A complete computer system consists of four parts:

- ✓ **Hardware:** Hardware represents the physical and tangible components of the computer.
- ✓ **Software:** Software is a set of electronic instructions consisting of complex codes (Programs) that make the computer perform tasks.
- ✓ **User:** The computer operators are known as users.
- ✓ **Data:** Consists of raw facts, which the computer stores and reads in the form of numbers.

Hardware			
Input Devices	Processing Devices	Output Devices	Storage Devices
Keyboard	Mother board	Monitor	Magnetic Disk
Microphone	Processor	Printer	Optical Disk
Mouse	RAM	Speaker	Flash Memory
Web camera	ROM		Magnetic Tape
Touch Screen	SMPS		
Light Pen			

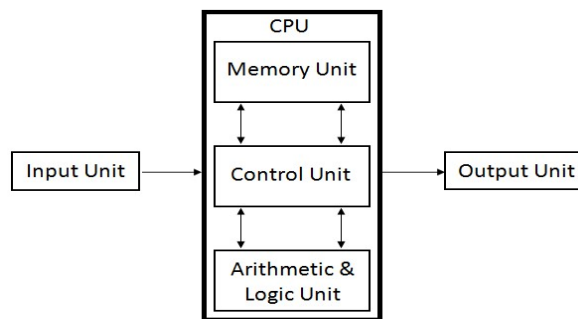
The following features characterize this electronic machine:

- ✓ Speed
- ✓ Reliability
- ✓ Accuracy
- ✓ Flexibility
- ✓ Storage and Retrieval
- ✓ Low cost
- ✓ Repeated Processing Capabilities

Software			
Utility Software	Application Software	System Software (OS)	
		Single user	Multi User
Utility Tools	Text		
Customized Software	Graphics	DOS	Unix
	Multimedia	Mac-OS	Windows Server
	Language	Windows xp,7,8.1	
	Accounting		

**Computer hardware consists of the following components:**

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



**Fig: The relationship between different hardware components**

**[A] CPU itself has following three components:**

- ✓ **ALU (Arithmetic Logic Unit):** When the control unit encounters an instruction that involves mathematical calculation or decision/logic, it passes the control to the second component, i.e., the arithmetic logic unit (ALU). The ALU includes a group of registers - memory locations built directly into the CPU - that are used to hold data that are being processed by the current instruction.
- ✓ **Registers:** The register is the smallest high-speed storage area in the CPU. All data must be represented in a register before it can be processed.
- ✓ **Control Unit:** This unit controls the operations of all parts of computer but does not carry out any actual data processing operations

**[B] Primary memory consists of mainly two types of memories:**

- ✓ **Random Access Memory (RAM):** RAM is the internal memory of the CPU for storing data, program and program result. It is read/write memory which stores data until the machine is working. As soon as the machine is switched off, data is erased.
- ✓ **RAM is volatile**, i.e. data stored in it is lost when we switch off the computer or if there is a power failure. Hence a backup uninterruptible power system (UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold.
- ✓ **Static Random Access Memory (SRAM):** A type of memory that is faster and less volatile than DRAM, but requires more power and is more expensive. The term static is derived from the fact that it does not need to be refreshed like DRAM.
- ✓ **Synchronous Dynamic Random Access Memory (SDRAM):** A type of DRAM that can run at much higher clock speeds.
- ✓ **Read Only Memory (ROM):** The memory from which we can only read but can not write on it. This type of memory is **non-volatile**. The information is stored permanently in such memories during manufacture. A ROM, stores such instructions that are required to start a computer. This operation is referred to as bootstrap.

**There are mainly three types of RAM available:**

- ✓ **Dynamic Random Access Memory (DRAM):** A type of physical memory used in most personal computers. The term dynamic indicates that the memory must be constantly refreshed (reenergized) or it loses its contents. This type of memory is more economical.

**There are mainly three types of ROM available:**

- ✓ **MROM (Masked ROM):** The very first ROMs were hard-wired devices that contained a pre-programmed set of data or instructions. These kinds of ROMs are known as masked ROMs which are inexpensive.
- ✓ **PROM (Programmable Read only Memory):** PROM is read-only memory that can be modified only once by a user. The user buys a blank PROM and enters the desired contents using a PROM program
- ✓ **EPROM (Erasable and Programmable Read Only Memory):** The EPROM can be erased by exposing it to ultra-violet light for a duration of up to 40 minutes. Usually, an EPROM eraser achieves this function.
- ✓ **EEPROM (Electrically Erasable and Programmable Read Only Memory):** The EEPROM is programmed and erased electrically. It can be erased and reprogrammed about ten thousand times. Both erasing and programming take about 4 to 10 ms (milli second).

## Memory

A memory is just like a human brain. It is used to store data and instructions. Computer memory is the storage space in computer where data is to be processed and instructions required for processing are stored. The memory is divided into large number of small parts called cells. Each location or cell has a unique address which varies from zero to memory size minus one.

Memory				
Primary Memory			Secondary Memory	
<b>Cache Memory</b>	<b>Main Memory</b>		<ul style="list-style-type: none"> <li>➤ Magnetic Disk(HDD)</li> <li>➤ Optical Disk (CD, DVD,BRD)</li> <li>➤ Flash Memory(Memory card, Pen Drive)</li> </ul>	
Registers	<b>RAM</b>			
	SRAM	DRAM		PROM
				EPROM
				EEPROM

### Memory is primarily of three types

- **Cache Memory:** It is a very high speed semiconductor memory which can speed up CPU. It acts as a buffer between the CPU and main memory.
  - **Primary Memory/Main Memory:** Primary memory holds only those data and instructions on which computer is currently working. It has limited capacity and data is lost when power is switched off.
  - **Secondary Memory:** This type of memory is also known as external memory or non-volatile. It is slower than main memory. These are used for storing data/Information permanently.
2. **Secondary Storage (External Storage Devices) :** Floppy diskettes, hard disk, tapes and optical disks come under the category of external storage devices or ancillary storage devices. These devices are very sensitive to environmental conditions (humidity and temperature) as well as to external magnetic fields and need to be stored carefully.
    - ✓ **Floppy Disk :** Floppy disks are primarily used on PCs. Information on a floppy disk is recorded in the magnetized states of particles of iron oxides evenly placed upon concentric circles known as tracks.
    - ✓ **Hard Disk:** It is a non-removable enclosed magnetic disk included in most PCs. It contains a stack of metal platters, each coated with iron oxide, that spin on a spindle and the entire unit is encased in a sealed chamber.
    - ✓ **Magnetic Tape:** This is plastic tape, usually made of Mylar that is coated with iron oxide, thereby enabling the introduction (writing); retention (memory) and reading of magnetically recorded information. The best use of tape storage is for data that you do not use very often.
  3. **Peripherals:** Peripheral devices are devices connected to the computer externally. If a peripheral device is disconnected, the computer will still be able to work; only functions performed by this peripheral device will not be available.

### Mainly there are following types of peripheral devices:

1. **Input Devices (How to tell it what to do):** This unit makes link between user and computer. The input devices translate the information into the form understandable by computer.
  - **Keyboard-** The most common and very popular input device which helps in inputting data to the computer
  - **Joy Stick-** To move cursor position on a monitor screen. It is mainly used in Computer Aided Designing (CAD) and playing computer games.
  - **Mouse-** Mouse is the most popular pointing device and cursor-control device having a small palm size box with a round ball at its base which senses the movement of mouse and sends corresponding signals to CPU when the mouse buttons are pressed.
  - **Light pen-** It is used to select a displayed menu item or draw pictures on the monitor screen.
  - **Track Ball-** Mostly used in notebook or laptop computer, instead of a mouse .This is a ball which is half inserted and by moving fingers on ball, pointer can be moved

- **Scanner-** A scanner allows you to scan printed material and convert it into a file format that may be used within the PC.
- **Digitizer-** It converts analog information into digital form.
- **Microphone-** Microphone is an input device to input sound that is then stored in digital form.
- **Magnetic Ink Card Reader (MICR)-** MICR input device is generally used in banks because of a large number of check to be processed every day.
- **Optical Character Reader (OCR)-** OCR scans text optically character by character, converts

them into a machine readable code and stores the text on the system memory.

- **Bar Code Reader-** A device used for reading bar coded data (data in form of light and dark lines). Bar coded data is generally used in labeling goods, numbering the books.
- **Optical Mark Reader (OMR)-** A special type of optical scanner used to recognize the type of mark **made** by pen or pencil.

## 2. **Output Devices: (How it shows you what it is doing)** Output devices translate the computer's output into the form understandable by users.

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

**There are two kinds of viewing screen used for monitors.**

- **Cathode-Ray Tube (CRT):** The CRT display is made up of small picture elements called pixels. The smaller the pixels, the better the image clarity, or resolution
- **Flat- Panel Display:** The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement in comparison to the CRT.

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

- **Impact Printers:** The impact printers print the characters by striking them on the ribbon which is then pressed on the paper.
- **Non-Impact Printers:** Non-impact printers print the characters without using ribbon. These printers print a complete page at a time so they are also called as Page Printers. Laser Printers, Inkjet Printers.

### Note:

- ✓ **Data:** Data can be defined as a representation of facts, concepts or instructions in a formalized manner which should be suitable for communication, interpretation, or processing by human or electronic machine.
- ✓ **Information:-** Information is organized or classified data which has some meaningful values for the receiver. Information is the processed data on which decisions and actions are based.
- ✓ **Data Processing Cycle:** Data processing is the re-structuring or re-ordering of data by people or machine to increase their usefulness and add values for particular purpose. Data processing consists of basic steps input, processing and output.

**These three steps constitute the data processing cycle.**

- ✓ **Input** - Input data is prepared in some convenient form for processing. The form will depend on the processing machine. For example, when electronic computers are used, the input data could be recorded on any one of several types of input medium, such as magnetic disks, tapes and so on.
- ✓ **Processing** - In this step input data is changed to produce data in a more useful form. For example, paychecks may be calculated from the time cards, or a summary of sales for the month may be calculated from the sales orders.
- ✓ **Output** - The result of the proceeding processing step are collected. The particular form of the output data depends on the use of the data. For example, output data may be pay-checks for employees.

### Language Processors:

- ✓ **Assembler:** This language processor converts the program written in assembly language into machine language.
- ✓ **Interpreter:** This language processor converts a HLL(High Level Language) program into machine language by converting and executing it line by line.
- ✓ **Compiler:-** It also converts the HLL program into machine language but the conversion manner is different. It converts the entire HLL program in one go, and reports all the errors of the program along with the line numbers.

## Classification of Computers:

Computers can be broadly classified by their speed and computing power:

Sr. No.	Type	Specifications
1	<b>PC</b> (Personal Computer)	It is a single user computer system having moderately powerful microprocessor.
2	<b>WorkStation</b>	It is also a single user computer system which is similar to personal computer but have more powerful microprocessor.
3	<b>Mini Computer</b>	It is a multi-user computer system which is capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
4	<b>Main Frame</b>	It is a multi-user computer system which is capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	<b>Supercomputer</b>	It is an extremely fast computer which can execute hundreds of millions of instructions per second.

Following are the main memory storage units:

S.No.	Unit	Description
1	Bit(Binary Digit)	A <b>binary digit</b> is logical 0 and 1 representing a passive or an active state of a component in an electric circuit.
2	Nibble	A group of 4 bits is called <b>nibble</b> .
3	Byte	A group of 8 bits is called <b>byte</b> . A byte is the smallest unit which can represent a data item or a character. (1 byte = 8 bits)
4	Word	A computer word, like a byte, is a group of fixed number of bits processed as a unit which varies from computer to computer but is fixed for each computer. The length of a computer word is called word-size or word length and it may be as small as 8 bits or may be as long as 96 bits. A computer stores the information in the form of computer words.

Few higher storage units are following:

S.No.	Unit	Description
1	Kilobyte (KB)	1 KB = 1024 Bytes
2	Megabyte(MB)	1 MB = 1024 KB
3	GigaByte (GB)	1 GB = 1024 MB
4	TeraByte (TB)	1 TB = 1024 GB
5.	PetaByte (PB)	1 PB = 1024 TB

## Software

**Software:** software represents the set of programs that govern the operation of a computer system and make the hardware run. **There are two types of software**

- **System Software:** The system software is collection of programs designed to operate, control, and extend the processing capabilities of the computer itself. System software are generally prepared by computer manufactures. System software serves as the interface between hardware and the end users. **Examples:** Operating System, Compilers, Interpreter, Assembler etc.
- **Application Software:** It is the set of programs necessary to carry out operations for a specified application.



## Application software can subdivide into three categories:

### (A) Packages:-

Packages	
<b>Word Processing</b>	A package that process textual matter and creates organized and flawless documents.
<b>Spreadsheets</b>	An electronic spreadsheet is a program that accepts data in a tabular form and allow users to manipulate , calculate, analyze data in the desired manner.
<b>Database Management Systems</b>	DBMS is a package that can handle and manage bulk of stored data.
<b>Desktop Publishing Software</b>	Handles page layout by combining the functions of a traditional typesetter and a layout artist.
<b>Graphics, Multimedia and Presentation applications</b>	Application software that manipulates images is known as Graphics software.

**(B) Utilities:** Utilities are those application programs that assists the computer by performing housekeeping functions like backing up disk or scanning viruses etc.

Utilities	
<b>Text Editor</b>	Program is used for creating, editing text files.
<b>Backup Utility</b>	Program facilities the backing-up of disk.
<b>Compression Utility</b>	Large files can be compressed so that it takes less storage area.
<b>Disk Defragmentor</b>	It speeds up disk access by rearranging the files and free space on your computer.
<b>Antivirus Software</b>	It scans yours disk for viruses and removes them if any virus is found.

**(C) Customized Software:** This type of software is tailor-made software according to a user's requirements.

### Following are the main five generations of computers:

S. No.	Generation & Description
1	<b>First Generation</b> (1946-1959) <b>Vacuum tube</b> based
2	<b>Second Generation</b> (1959-1965) <b>Transistor</b> based
3	<b>Third Generation</b> (1965-1971) <b>Integrated Circuit</b> based
4	<b>Fourth Generation</b> (1971-1980) <b>VLSI microprocessor</b> based
5	<b>Fifth Generation</b> (1980-onwards) <b>ULSI microprocessor</b> based

**Boot:** When computer starts, the operating system is first loaded (as it is essential for running all other programs), this process is known as booting.

**Cold Boot:** -When you turn the computer ON from an OFF position.

**Warm Boot:** - When you reset the computer that is already ON.

**Motherboard:** The motherboard serves as a single platform to connect all of the parts of a computer together. A motherboard connects CPU, memory, hard drives, optical drives, video card, sound card, and other ports and expansion cards directly or via cables. It can be considered as the backbone of a computer.

## Software categories

**Freeware:** Software which is completely costless. The producers of this software are either public institutions such as universities or developers who do it for personal interest or advertisement or private company who do it for dumping reasons.

**Shareware:** Software which is initially costless but after a certain period the user is asked to pay a fee or delete it. Or software which has two versions a free one, but incomplete or with advertisement banners and a complete advertisement free one for which the user must pay. The most common example is WinZip compression program.

**Commercial:** Software for which the user has to pay a license to use it. Common examples are Microsoft Windows operating system and Microsoft word.

**Private:** Software uniquely built, under payment for a specific customer to fit his need. Only the customer may use it.

**Open Source:** Software may be modified by anyone, sometimes under certain restrictions. Open source software is also freeware.

**Proprietary:** Software is distributed with the explicit with the explicit legal warning not to modify it and technically locked to prevent other developers to see or modify its source.

## Number System

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

**A value of each digit in a number can be determined using**

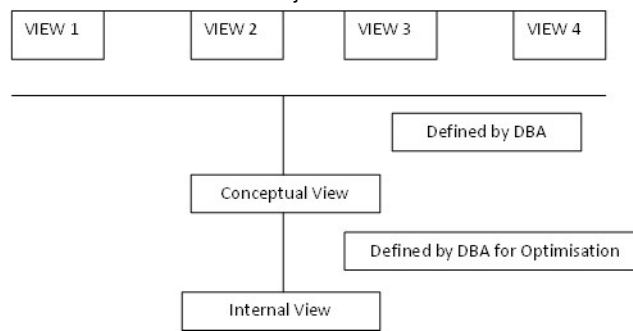
- ✓ The digit
  - ✓ The position of the digit in the number
  - ✓ The base of the number system (where base is defined as the total number of digits available in the number system).
1. **Decimal Number System:** The number system that we use in our day-to-day life is the decimal number system. Decimal number system has base 10 as it uses 10 digits from 0 to 9. In decimal number system, the successive positions to the left of the decimal point represent units, tens, hundreds, thousands and so on.
  2. **Binary Number System:** Uses two digits, 0 and 1, also called base 2 number system. Each position in a binary number represents a 0 power of the base (2). Last position in a binary number represents a x power of the base (2).
  3. **Octal Number System:** Uses eight digits, 0,1,2,3,4,5,6,7, also called base 8 number system, Each position in an octal number represents a 0 power of the base (8).
  4. **Hexadecimal Number System:** Uses 10 digits and 6 letters, 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F. Letters represents numbers starting from 10. A = 10, B = 11, C = 12, D = 13, E = 14, F = 15. Also called base 16 number system. Each position in a hexadecimal number represents a 0 power of the base (16).

## DBMS – Data Base Management System

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

**Architecture of DBMS** divided into three levels:

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



### Keys in DBMS:

- ✓ **Super key** of an entity set is a set of one or more attributes whose values uniquely determine each entity.
- ✓ **Candidate key** of an entity set is a set of fields from which primary key can be selected. It is an attribute or a set of attributes that can act as a primary key for a table to uniquely identify each record in a table.
- ✓ **Primary key** is a candidate key that is most appropriate to become main key of the table. It is a key that uniquely identifies each record in the table

### LOGIC GATES

**Logic gate:** is an elementary building block of a digital circuit. Most logic gates have two inputs and one output.

At any given moment, every terminal is in one of the two binary conditions low (0) or high (1). There are seven basic logic gates: AND, OR, XOR, NOT, NAND, NOR, XNOR

### Networking

**Network:** Computer Networks means interconnected set of autonomous system that permits distributed processing to information.

#### Five components:

- ✓ Sender Computer
- ✓ Sender equipment (Modem)
- ✓ Communication Channel ( Telephone Cables)
- ✓ Receiver Equipment (Modem)
- ✓ Receiver Computer

#### Classified on the basis of Geographical Coverage:

- **Local Area Network (LAN):** A local area network is relatively smaller and privately owned network with the maximum span of **10 km**.
- **Metropolitan Area Network (MAN) :** MAN is defined for less than **50 Km** and provides regional connectivity within a campus or small geographical area.
- **Wide Area Network (WAN):** A wide Area Network (WAN) is a group Communication Technology ,provides **no limit** of distance.

### Types of Network

1. **Point to Point Network:** When a packet is sent from one router to another intermediate routers, the entire packet is stored at each intermediate router, stored there till the output line is free and then forwarded. A subnet using this principle is called **point to point** or **packet switched network**.

#### Topologies for a point to point Subnet

- **Star:** Each device has a dedicated point to point link only to a central controller, usually called a hub.
  - **Tree:** A tree topology is a variation of a star.
  - **Ring:** Each device has a dedicated point to point line configuration only with the two devices on either side of it.
  - **Bus:** One long cable acts as a backbone to link all the devices in the network.
2. **Broadcast Networks:** Broadcast networks have a single communication channel that is shared by all the machines on the network.

## Open Systems Interconnection model (OSI)

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

### Seven layers of OSI Model are:

- **Application Layer:** The application layer is the OSI layer closest to the end user, which means both the OSI application layer and the user interact directly with the software application.
- **Presentation Layer:** The presentation layer establishes context between application-layer entities, in which the application-layer entities may use different syntax and semantics if the presentation service provides a big mapping between them.
- **Session Layer:** The session layer controls the dialogues (connections) between computers. It establishes, manages and terminates the connections between the local and remote application.
- **Transport Layer:** The transport layer provides the functional and procedural means of transferring variable-length data sequences from a source to a destination host via one or more networks, while maintaining the quality of service functions.
- **Network Layer:** The network layer provides the functional and procedural means of transferring variable length data sequences from one node to another connected to the same network.
- **Data link Layer:** The data link layer provides node-to-node data transfer -- a link between two directly connected nodes. It detects and possibly corrects errors that may occur in the physical layer.
- **Physical Layer:** It defines the electrical and physical specifications of the data connection. It defines the relationship between a device and a physical transmission medium.

### Transmission Media

- **Network Cables:** Network cables are used to connect computers. The most commonly used cable is Category 5 cable RJ-45.
- **Distributors:** A computer can be connected to another one via a serial port but if we need to connect many computers to produce a network, this serial connection will not work. The solution is to use a central body to which other computers, printers, scanners etc. can be connected and then this body will manage or distribute network traffic
- **Repeaters:** A repeater is an electronic device that receives a signal and retransmits it at a higher level or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances.
- **Bridge:** A bridge is a product that connects a local area network (LAN) to another local area network that uses the same protocol (for example, Ethernet or token ring).
- **Routers:** A router is a device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP's network. Router sare
  - located at gateways, the places where two or more networks connect.
- **Internal Network Cards:** Network card is a necessary component of a computer without which a computer cannot be connected over a network. It is also known as network adapter or Network Interface Card (NIC). Most branded computers have network card pre-installed. Network cards are of two types: Internal and External Network Cards.
- **External Network Cards:** External network cards come in two flavours like Wireless and USB based. Wireless network card need to be inserted into the motherboard but no network cable is required to connect to network.
- **Universal Serial Bus (USB):** USB card are easy to use and connect via USB port. Computers automatically detect USB card and can install the drivers required to support the USB network card automatically.
- **Modem (Modulator -DE Modulator):** Modem is a device attached to computers that can convert digital signals to analog signals to analog signals and vice versa.

## Operating System:-

An Operating system is a program, which acts as an interface between a user and the hardware.

### Characteristics of Operating System:

- ✓ **Memory Management** -- keeps tracks of primary memory i.e. what part of it is in use by whom, what part is not in use etc. and allocates the memory when a process or program requests it.
- ✓ **Processor Management** -- allocates the processor(CPU) to a process and de-allocates processor when it is no longer required.
- ✓ **Device Management** -- keeps track of all devices. This is also called I/O controller that decides which process gets the device, when, and for how much time.
- ✓ **File Management** -- allocates and de-allocates the resources and decides who gets the resources.
- ✓ **Security** -- prevents unauthorized access to programs and data by means of passwords and similar other techniques.
- ✓ **Job accounting** -- keeps track of time and resources used by various jobs and/or users.
- ✓ **Control over system performance** -- records delays between request for a service and from the system.
- ✓ **Interaction with the operators** -- The interaction may take place via the console of the computer in the form of instructions. Operating System acknowledges the same, does the corresponding action and informs the operation by a display screen.
- ✓ **Error-detecting aids** -- Production of dumps, traces, error messages and other debugging and error-detecting methods.
- ✓ **Coordination between other software and users** -- Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

### MS - Window

**MS-Windows** is a GUI based operating system. In Windows Operating system multiple applications can be simultaneously run in different windows.

- In **MS-Windows**, the screen upon which icons, windows, too are displayed is known as **desktop**.
- An **icon** is a graphic symbol that represents a window element like, file, folder, or **shortcut**.
- Loading up of operating system files into the computer's memory is called **booting up**.
- The **taskbar** is a bar, which is usually located at the bottom of the screen.
- **My computer** is helpful for viewing the contents of a single folder or drive.
- **Windows Explorer** is another way of seeing what is on your computer. Windows Explorer shows the computer's contents as a hierarchy.
- **File:** A program or document stored on a disk.
- **Toolbar:** A set of button you click to perform common tasks.
- A **folder** is a location in which you can store files and other folders.
- To create a new folder, **File—New—Folder** commands are clicked in My Computer windows.
- To find files or folders, **Start---Find---Files** or **Folder** commands are clicked.
- To create a **shortcut** to a file, firstly select the file or folder, whose shortcut is to be created. Then drag the file icon through right mouse button to desired location where shortcut to be placed, and then select create shortcut(s).
- **To shut down** the computer, **Start—Shut Down** commands are clicked.

### MS-Word

- ✓ A **word processor** is a package that processes textual matter and creates organized and flawless documents.
- ✓ The word processor offers very useful features like speed, powerful editing and formatting features, permanent storage, Graphics, object linking and embedding, spell check and mail merge etc.
- ✓ The word processor automatically fits the typed text within the specified left and right margins. This feature is called word wrapping.
- ✓ Margins can be four type viz. left, right, top and bottom.
- ✓ The distance between text boundaries and page margins is called indent. The indent can be positive, negative or hanging indent.
- ✓ The text layout

- ✓ In Word, paragraphs can be formatted through Paragraph option of Format menu and the borders can be applied through Borders and shading option of Format menu.
- ✓ The page formatting in Word can be controlled through Page Setup ... option of **File** menu. The header and footer can be created and formatted using Header and Footer option of the view menu.
- ✓ In word, the document can either be printed through print button of standard toolbar or through the Print.. option of **File** menu. The help is available in Word through the Help menu.
- ✓ In word, spelling and grammar can be checked either through the **spelling and Grammar** option of Tools menu.
- ✓ The Autocorrect feature of Word converts shorthand into longer strings. You can create your own Autocorrect entries by clicking to **Autocorrect** command to **Tools** menu.
- ✓ Tables can be inserted in a Word document through Table button of Standard toolbar and can be manipulated through the table drop menu.
- ✓ In MS-Word, **the mail merge** involves two files – Main document and data source file to produce the merged document. The main document and data source can handled through Mail Merge option of Tools menu.

## Shortcuts

Shortcut	Description
Ctrl+W	Close the active window / document
Ctrl+Z	Undo an action
Ctrl+Y	Redo the last action or repeat an action
Ctrl+S	Save a document
Ctrl+P	Print a document
Ctrl+K	Insert a hyperlink.
Alt+Right.	Arrow Go forward one page.
Ctrl+C	Copy selected text or graphics to the Office Clipboard.
Ctrl+V	Paste the most recent addition to the Office Clipboard.
Ctrl+Shift+A	Format all letters as capitals.
Ctrl+B	Applies or removes bold formatting.
Ctrl+I	Applies or removes italic formatting.
Ctrl+=	Apply subscript formatting (automatic spacing).
F1	Open Help
F4	Repeat the last action performed(Word 2000+)
F5	Open the Find, Replace, and Go To window in Microsoft Word
F7	Spellcheck and grammar check selected text or document
F12	Save As

## Some of the valid file names are as follows:

Type of File	File name and Extension
Notepad File	Type.txt
Paintbrush File	Painting.bmp
Word	Document.doc
Excel	Book.xls
PowerPoint	Presentation.ppt
Database	Db1.mdb
Executable	Game.exe

## MS-EXCEL

- ✓ A **spreadsheet** is a software tool that lets one enter, calculate, manipulate and analyze set of numbers.
- ✓ A **Worksheet** is a grid of cells made up of horizontal rows and vertical columns.
- ✓ A workbook is a group of worksheets.
- ✓ Three types of data can be entered in a worksheet (i) **number** (ii) **Text** (iii) **Formulas**.
- ✓ Cell can be referenced in three ways (i) **relative** (ii) **absolute** (iii) **mixed**
- ✓ A cell can be edited either by **overwriting or by partially modifying the cell contents**.
- ✓ A **range** can be selected using mouse or keyboard.
- ✓ A range can be either through **copy and paste** operations or by dragging the fill handle.
- ✓ A range can be moved either through cut and paste operations or by dragging the range border.
- ✓ A range can be cleared through **Edit--Clear** command.
- ✓ To erase everything from a worksheet, select all the cells in the worksheet and then use **Edit—Clear—All**.
- ✓ To save a workbook use **File- Save** command.
- ✓ To open a workbook use **File—Open** command.
- ✓ To insert cells, rows or columns in worksheet, use **Insert---Cells----**, **Insert-----Rows** or **Insert-----Column** command respectively.
- ✓ General arrangement of data is known as formatting.
- ✓ Formatting does not affect the actual cell value only the appearance change.
- ✓ Formatting is performed in MS Excel through options available in Format menu.
- ✓ Charts are the pictorial representation of worksheet data.
- ✓ Various chart types in MS- Excel are area chart, column chart, bar chart, line chart, pie chart, XY(Scatter) chart
- ✓ Chart in MS-Excel saved in two ways : (i) embedded chart (ii) chart sheet
- ✓ Embedded chart is a chart object that is placed on a worksheet and saved with that worksheet.
- ✓ Chart sheet is a sheet in workbook that contains only a chart.
- ✓ Charts are created using chart wizard.

## Power point

- ✓ The application software that can create professional looking visual aids is called Presentation Graphics Software.
- ✓ **MS-PowerPoint** can be started by clicking at Start—Program---Microsoft Power Point.
- ✓ A slide can contain one or more of these components: **Titles, Graphs, Drawing objects, ClipArt and Pictures**.
- ✓ The slide components that are used for reference are: **Handouts, Notes, Outlines**.
- ✓ A new presentation can be created through one of these methods:(i) **Auto content Wizard** (ii) **Design Templates** (iii) **Sample Presentation** and (iv) **Blank Presentation**
- ✓ A new slide can be added by either clicking at **Common Tasks** options of **Formatting** toolbar and then selecting New Slide option, by clicking at Insert menu's **New Slide** option.
- ✓ A presentation in PowerPoint can viewed in any of these views: **Normal, Outline, Slide, Slide Sorter, Slide Show** and **Notes Page View**.
- ✓ To apply new design to slides, click either at Apply Design Template option of **Common Tasks** options of Formatting toolbar, or at Format menu's Apply Design Template option or even from the shortcut menu.
- ✓ A color scheme is a combination of various colors used for text and other presentation elements.
- ✓ A color scheme can be changed by clicking at **Slide Color Scheme** option of Format menu.
- ✓ Background color can be changed by clicking at **Format---Background** command or even through slide's shortcut menu.
- ✓ You can change text font and style by using **Format---Font** command.
- ✓ Header and Footer information can be viewed and changed by clicking at **View---Header** and Footer option.
- ✓ The slide ---shorter view is useful for viewing the slides in miniature forms and for rearranging them.
- ✓ Movies (Video) & Sound can be inserted by using Insert—**Movies & Sounds** command.
- ✓ While creating slide shows you can add transitions to slides by using Slide Show --- Slide Transition command.
- ✓ To add animation, you can use Slide **Show-----Custom** Animation commands.

## Internet

- The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to link several billion devices worldwide. It also known as “**network of networks**” that consists of millions of private, public, academic, business, and government networks.

### Various Applications of Internet are:

- ✓ Exchange messages using e-mail (Electronic mail).
  - ✓ Transfer files as well as software.
  - ✓ Browse through information on any topic on web.
  - ✓ Communicate in real time (chat) with others connected to the Internet.
  - ✓ Search databases of government, individuals and organizations.
  - ✓ Read news available from leading news groups.
  - ✓ Send or receive animation and picture files from distant places.
  - ✓ Set up a site with information about your company's products and services.
- The **World Wide Web** commonly known as the Web or www developed founded by **Tim Berners-Lee** in 1989, is a system of interlinked hypertext documents that are accessed via the Internet. These multimedia pages are ever-changing.
  - A **web browser** (commonly referred to as a browser) is a software application for retrieving, presenting and traversing information resources on the World Wide Web.

### Various features of a Web Browser are:

- ✓ **Menu bar:** The menu bar, located at the very top of the screen, can be accessed using the mouse. Actions that are in black can be performed, while actions that cannot be performed will be in gray or lightened.
- ✓ **Tool bar:** The tool bar is located at the top of the browser; it contains navigational buttons for the Web. Basic functions of these buttons include:

<b>Command</b>	<b>Function</b>
<b>Home</b>	Opens or returns to starting page
<b>Back</b>	Takes you to the previous page
<b>Forward</b>	Takes you to the next page
<b>Print</b>	Prints current page
<b>Stop</b>	Stops loading a page
<b>Reload</b>	Refresh/redisplays current page
<b>Search</b>	Accesses search engine

- ✓ **Location bar:** The location bar, below the tool bar, is a box labelled "Location," "GoTo," or "Address." You can type in a site's address, and press the Return or Enter key to open the site.
- ✓ **Status bar:** The status bar is located at the very bottom of the browser window. You can watch the progress of a web page download to determine if the host computer has been contacted and text and images are being downloaded.
- ✓ **Scroll bar:** The scroll bar is the vertical bar located on the right of the browser window. You can scroll up and down a web page by placing the cursor on the slider control and holding down the mouse button.
- ✓ A **website** is a set of related web pages served from a single web domain.
- ✓ The **Uniform Resource Locator**, abbreviated as URL is the Address for web sites. Most of them begin with http (Hyper Text Transfer Protocol), followed by a colon and two slashes.. In most web browsers, the URL of a web page is displayed on top inside an address bar. An example of a typical URL would be "**http://www.gradestack.com**".
- ✓ A **Home page, index page, or main page** is a page on a website. A home page usually refers to:
- ✓ A **Hyperlink** is a reference to data that the reader can directly follow either by clicking or by hovering or that is followed automatically.
- ✓ **Downloading** means to receive data to a local system from a remote system, or to initiate such a data transfer.
- ✓ **Uploading** refers to the sending of data from a local system to a remote system such as a server or another client with the intent that the remote system should store a copy of the data being transferred.
- ✓ An **email attachment** is a computer file sent along with an email message. One or more files can be attached to any email message, and be sent along with it to the recipient. The first email was sent by **Ray Tomlinson** to himself in 1971.
- ✓ **CC (Carbon Copy)** in e-mail indicates those who are to receive a copy of a message addressed primarily to another. The list of CCed recipients is visible to all other recipients of the message.



- ✓ An additional **BCC (blind carbon copy)** field is available for hidden notification; recipients listed in the BCC field receive a copy of the message, but are not shown on any other recipient's copy (including other BCC recipients).
- ✓ The **Drafts folder** retains copies of messages that you have started but are not yet ready to send.
- ✓ **Hotmail**, a free e-mail service provided by Microsoft which was established in 1995 was co - founded by an Indian American entrepreneur Sabeer Bhatia along with Jack Smith in July of 1996.
- ✓ An **Internet Protocol address** (also known as an **IP address**) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network. It acts as an identifier for a computer. It is a unique address for every computer.
- ✓ **Top-level domain:** Each part of a domain name contains certain information. The first field is the host name, identifying a single computer or organization. The last field is the top-level domain, describing the type of organization and occasionally country of origin associated with the address. For e.g. - .com – **Commercial**, .edu – **Educational**

### Important Key in a Keyboard

**Toggle keys-** toggle the input from a group of keys on a keyboard between two different input modes.

- ✓ Caps Lock
- ✓ Num Lock
- ✓ Scroll Lock
- ✓ Insert

**Modifier Keys** - In computing, a modifier key is a special key (or combination) on a computer keyboard that temporarily modifies the normal action of another key when pressed together. For e.g.-

- ✓ Shift
- ✓ Alt
- ✓ Ctrl
- ✓ Fn

**Function keys** – A function key is a key on a computer or terminal keyboard which can be programmed so as to cause an operating system command interpreter or application program to perform certain actions, a form of soft key. For e.g. - **F1 through F12** keys are known as function keys. Each keys perform different functions.

### Computer Viruses:

A virus is a parasitic program that infects another legitimate program, which is sometimes called the host. To infect the host program, the virus modifies the host so that it contains a copy of the virus.

- ✓ **Boot sector viruses:** A boot sector virus infects the boot record of a hard disk. The virus allows the actual boot sector data to be read as through a normal start-up were occurring.
- ✓ **Cluster viruses:** If any program is run from the infected disk, the program causes the virus also to run. This technique creates the illusion that the virus has infected every program on the disk.
- ✓ **Worms:** A worm is a program whose purpose is to duplicate itself.
- ✓ **Bombs:** This type of virus hides on the user's disk and waits for a specific event to occur before running.
- ✓ **Trojan Horses:** A Trojan Horses is a malicious program that appears to be friendly. Because Trojan Horses do not make duplicates of themselves on the victim's disk. They are not technically viruses.
- ✓ **Stealth Viruses** These viruses take up residence in the computer's memory, making them hard to detect.
- ✓ **Micro Viruses:** A macro virus is designed to infect a specific type of document file, such as Microsoft Word or Microsoft Excel files. These types of documents can include macros, which are small programs that execute commands.

### Commonly Used Computer Terms

- ✓ **Abort:** To stop a program or function before it has finished.
- ✓ **Algorithm:** A set of instructions that provides a solution to a given problem.
- ✓ **Animation:** A simulation of movement created by displaying a series of pictures, or frames. For example, cartoons on television.
- ✓ **ANSI:** American National Standards Institute, a powerful industry association of USA, promoting Programming language standards.
- ✓ **Antivirus:** Program A utility that searches a hard disk for viruses and removes any, that is found.
- ✓ **Architecture:** A design. It can refer to either hardware or software or to a combination of

hardware and software. The architecture of a system defines its broad outlines.

- ✓ **ASCII:** American Standard Code for Information Interchange. This is a seven/eight bit code widely used in computers for the transfer of data.
- ✓ **Bandwidth:** The amount of data that can be transmitted in a fixed amount of time. It is usually expressed in bits per second (bps) or bytes per second.
- ✓ **Bit:** The smallest unit of information in computer system. Bit is short for binary digit; either a "1" or a "0".
- ✓ **Boot:** The process of getting the computer started.
- ✓ **Byte:** A byte is made up of 8 bits. The amount of memory it takes to store a single character.
- ✓ **Cache:** A separate area of Primary Memory (RAM) where the computer stores a copy of frequently used information for quick access. This is meant to speed up the operation of the hard disk.
- ✓ **CD-ROM:** Compact Disk-Read Only Memory. This is a permanent storage device used to store large quantities of information that need not be changed.
- ✓ **CGA:** Color Graphics Adapter. Low-resolution screen (640x200 pixels) with color capability.
- ✓ **Character:** A number, letter, symbol, or punctuation mark.
- ✓ **Chip:** A small piece of silicon containing thousands or millions of electrical elements. Also called an Integrated Circuit (IC).
- ✓ **Compatible:** The ability of one device or program to work with another device or program. For example, a printer and a computer are said to be compatible if they can be connected to each other.
- ✓ **Conventional Memory:** The first 640K of Electronic Memory (RAM) in a computer used to run OS and applications.
- ✓ **Debug:** In computer related systems, fixing software related problem is known as debugging.
- ✓ **Digitize:** To scan a piece of artwork in very fine detail and store it in a form that computer understands.
- ✓ **DOS:** It stands for Disk Operating System. It is a single user operating system.
- ✓ **DVD:** Digital Versatile Disc or Digital Video Disc
- ✓ **Dynamic:** Refers to actions that take place at the moment they are needed rather than in advance.
- ✓ **EDP:** Electronic Data Processing.
- ✓ **E-Mail:** Electronic Mail. A facility to send electronic messages to another person on a computer network.
- ✓ **End-User:** The end user is the individual who uses the product after it has been fully developed and marketed.
- ✓ **EPROM:** Erasable Programmable Read Only Memory. A type of ROM that can be programmed or reprogrammed usually by exposing a normally covered sector to UV-Light.
- ✓ **Extended Memory:** Memory in addition to conventional memory used to run and manage

applications; together with expanded memory, it helps PCs to address increased amounts of data in memory.

- ✓ **Fax/Facsimile:** A way of transmitting copies of documents over telephone lines. Fax is short for Facsimile.
- ✓ **Gigabyte:** Abbreviated as GB, is equal to 1024 MB.
- ✓ **GUI Graphical User Interface:** A user interface that works visually and is based on the selection of actions using a mouse or a similar pointing device to click on icons or to pick options from menus; see also icon.
- ✓ **Hertz:** A unit of frequency that means Cycles per Second.
- ✓ **High Density:** The amount of information a disk can hold. High Density disks hold more information than Double Density disks.
- ✓ **Hypertext:** A method of presenting information so the user can view it in a non-sequential way, regardless of how the topics were originally arranged. It has now evolved as a flexible software technology to create electronic books provides fast and flexible access search criteria and provides quick access to information in large documents.
- ✓ **HTML:** Hyper Text Markup Language. A markup or structuring language used to describe Web and Intranet documents. It is used to define structure, appearance and placement of HTML elements including, fonts, graphics, text, hypertext links to other sites and many more details.
- ✓ **IBM:** International Business Machines, a USA based multinational Company.
- ✓ **Icon:** A graphical screen element that executes one or more commands when selected with a mouse or other pointing device
- ✓ **IDE:** Integrated Device Electronics, a standard used for connecting hard drive to a computer. IDE hard drives are very common and relatively inexpensive.
- ✓ **Intel:** The manufacturer of the most popular microprocessors or CPUs.
- ✓ **Intelligent:** Printer Printer combining laser, computer and photocopying technology.
- ✓ **Internet:** The world's largest computer network that links many of the scientific, research and educational computers as well as commercial networks. The internet uses TCP/IP protocols, and computers on Internet can run on any operating system, like, several variations of UNIX, Windows NT, and VMS etc.
- ✓ **Intranet:** In the most general sense, a private corporate network that uses Internet technology based software and TCP/IP protocol standards. Many companies use intranets for tasks as simple as distributing a company letter and for tasks as complex as posting and updating technical support bulletins to service personnel worldwide. An intranet does not always include permanent connection to Internet.
- ✓ **Kilobyte (K, KB)** Approximately one thousand characters; actually 1024bytes.

- ✓ **LAN** An acronym for local area network. A system of PCs that are located relatively near to each other and connected by wire so that individual users can cooperatively process information and share resources; see also WAN.
- ✓ **Laptop Computer**: A portable computer, small enough to be held on a lap, but slightly larger than a notebook computer.
- ✓ **LED**: Light Emitting Diode. An electronic device that lights up when electricity is passed through it.
- ✓ **Light Pen**: An input device that allows a user to write on or point to a special pad or the screen of a pen-based computer, such as a PDA.
- ✓ **Macintosh**: A PC based on a Motorola microprocessor employing GUI. Apple Macintosh has been in use since late eighties.
- ✓ **Macro**: A symbol, name, or key that represents a list of commands, actions or keystrokes.
- ✓ **Math co-processor**: Part of the microprocessor; a companion chip designed to perform complex calculations.
- ✓ **Megabyte (M, MB)**: Approximately one million characters; actually 1,048,576 bytes. A measure of memory or storage.
- ✓ **Megahertz (MHz)**: A measure of processing speed. The higher the value, the faster a computer can work.
- ✓ **Microprocessor**: A single chip containing all the elements of a computer's CPU.
- ✓ **MIPS**: Million Instructions Per Seconds, a unit for measuring the speed of a computer.
- ✓ **Mother Board**: The main circuit board of a computer which carries electrical signals to and from various parts of the computer.
- ✓ **Multimedia**: A computer system that combines text, graphics, animation, music, voice and video media; may include stereo speakers as an output device.
- ✓ **Multiprocessing**: It refers to a computer system's ability to support more than one process at the same time. It is also called multitasking.
- ✓ **Nibble**: Half a byte i.e. 4bits
- ✓ **Non-Volatile Memory**: This is data storage that does not lose its contents on power off; for example, ROM.
- ✓ **Notebook Computer**: A portable computer, approximately 8½ by 11 inches, that fits inside a briefcase.
- ✓ **Numeric keypad**: The part of a keyboard that looks like an adding machine, with 10 digits and mathematical operators; usually located on the right side of the keyboard.
- ✓ **Office-Automation**: The use of computer systems to execute a variety of office operations, such as word processing, accounting and Email.
- ✓ **Parallel Port**: An outlet on a computer used to attach a device, such as a printer. A parallel port sends data (bits) down the wire side by side (parallel to each other).
- ✓ **Pentium**: The fifth generation of microprocessors. The Pentium is 2 to 3 times faster than the 80486, the fourth generation of microprocessors.
- ✓ **Peripheral**: Any piece of hardware attached to the outside of a computer. Examples are printers and modems.
- ✓ **Pixel**: Short for "Picture Element". A Pixel is the smallest dot the computer can control on the screen.
- ✓ **Portable computer**: A small computer that usually runs on batteries. In the categories of portable computers are laptop, notebook, sub-notebook and palmtop.
- ✓ **Protocol**: In networking and communications, the formal specification that defines the procedures to follow when transmitting and receiving data. Protocol defines the format, timing, sequence and error checking used on the network.
- ✓ **Resolution**: The size and quantity of dots that make up a printed page, screen or scanned image.
- ✓ **Runtime Error**: An error that occurs during the execution of a program.
- ✓ **Scanner**: An input device used to copy a printed document into a computer's memory in digital form, without requiring manual keying.
- ✓ **SCSI**: Small Computer System Interface. A standard for connecting a hard drive to a computer.
- ✓ **Serial Port**: An outlet on a computer used to attach a device, such as a modem. A serial port sends data (bits) down the wire one at a time (in a series).
- ✓ **Service Pack**: It is an update to a software version that fixes an existing problem, such as a bug or provides enhancements to the product that will appear in the next version of the product.
- ✓ **TCP/IP**: Transmission Control Protocol / Internet Protocol is a set of communication protocols that encompass media access, packet transport, session communications, file transfer, e-mail, and terminal emulation. TCP/IP is supported by a large number of H/W and S/W vendors and is available on many computer systems, from PCs to mainframes.
- ✓ **Troubleshoot**: To isolate the source of a problem and fix it. In case of computer systems, troubleshoot is usually used when the problem is hardware related.
- ✓ **UNIX**: A multi user operating system.
- ✓ **Upgrade**: A new version of a software or hardware product designed to replace an older version of the same product.
- ✓ **UPS**: Uninterruptible Power Supply. It is a power supply that includes a battery to maintain power in the event of a power cut for several minutes to some hours.
- ✓ **Utility**: A program that performs a very specific task, usually related to managing system resources.

## Some expected and important questions of Computer Awareness for upcoming examinations

### Computer Questions

- The copy command saves to:
  - the desktop
  - the clipboard
  - Microsoft Word
  - Paste
  - None of these

**Ans: (B)** A special file or memory area where data is stored temporarily before being copied to another location is called clipboard. Copying data saves in clipboard.
- Vacuum Tube is the invention .....generation.
  - 1st generation
  - 2<sup>nd</sup> gen
  - 4th gen
  - 5<sup>th</sup> gen
  - None of these

**Ans: (A)** In **first Generation** (1940-1956), the first computers used **vacuum tubes** for circuitry and magnetic drums for memory and were often enormous, taking up entire rooms.
- The computer size was very large in\_\_.
  - First Generation
  - Second Generation
  - Third Generation
  - Fourth Generation
  - None of these

**Ans: (A)** **First generation** computers used **1000s of vacuum tubes** that required **lot of space** made them gigantic in size. **Single transistor** could replace 1000 vacuum tubes and a single **IC chip** replaced **1000s of transistors** made computers smaller and more speedy.
- \_\_\_is responsible for overall control and coordination of instruction execution.
  - CPU
  - ALU
  - RAM
  - Control Unit
  - None of these

**Ans: (D)** The **control unit** (CU) is a component of a computer's **central processing unit** (CPU) that directs operation of the processor. It tells the computer's **memory, arithmetic/logic unit, input and output** devices how to respond to a program's instructions.
- Which of the following is the fastest type of computer?
  - Minicomputer
  - Mainframe computer
  - Supercomputer
  - Digital computer
  - None of these

**Ans: (C)** A **supercomputer** is a computer with great **speed** and **memory**. Supercomputer channels all its power into executing a few **programs** as fast as possible.
- Which of these is not a computer manufacturer?
  - IBM
  - Apple
  - Microsoft
  - Sun
  - None of these

**Ans: (C)** **Microsoft** manufactures a variety of **software programs** and its **Operating System** Windows is one of the most popular Operating Systems around. It however does not manufacture computers.
- Which of the following is not an input device?
  - OCR
  - Optical scanners
  - Voice recognition device
  - COM (Computer Output to Microfilm)
  - None of these

**Ans: (D)** An **input device** is a peripheral used to provide data and control signals to an information processing system such as a computer or information appliance. **Examples** of input devices include **keyboards, mice, Optical scanners, digital cameras, Voice recognition device, OCR and joysticks**.
- Who among the following is the odd one\_\_\_?
  - Mouse
  - Scanner
  - Printer
  - Keyboard
  - None of these

**Ans: (C)** Except **Printer** (Output device) all are examples of input devices (**keyboards, mouse, scanners**).
- What is Skylake?
  - NASA's new mission
  - Upcoming James Bond's Movie
  - Core Processors
  - China's New Fourth Generation Aircraft
  - None of these

**Ans: (C)** **Skylake** is Intel's Sixth generation **Core Processors**.

10. Which is not a storage device?

- A. Printer                      B. CD  
C. Hard disk                    D. Floppy Disk  
E. DVD

**Ans (A) Storage device** is a piece of **computer** equipment on which information can be **stored**. But **Printer** is the **External device** that **communicates** with another **digital device** to **print** what a user sees on a **screen**.

11. \_\_\_\_\_ technologies is used by banks for faster processing of large volumes of cheques.

- A. OCR                      B. OMR  
C. MICR                    D. Bar code  
E. None of these

**Ans: (C) Magnetic Ink Character Recognition Code** is a character-recognition technology used mainly by the banking industry to ease the processing and clearance of cheques and other documents.

12. Who invented Analytical engine?

- A. Blaise Pascal              B. George Bool  
C. Charles Babbage        D. Dr. Herman Hollerith  
E. None of these

**Ans (C) The Analytical Engine** was a proposed mechanical **general-purpose computer** designed by English mathematician and computer pioneer **Charles Babbage**.

13. Memory which forgets everything when you switch off the power is known as\_\_\_\_\_.

- A. Corrupted                B. Volatile  
C. Non-Volatile            D. Non Corrupted  
E. None

**Ans (B) Non-volatile** keeps memory when the computers power is switched off. **Volatile** dumps everything in RAM when the computer **loose** power.

14. Which of the following code used in present day computing was developed by IBM Corporation?

- A. ASCII                      B. Hollerith Code  
C. EBCDIC Code              D. Baudot Code  
E. None of these

**Ans: (C) Extended Binary Coded Decimal Interchange Code (EBCDIC)** is an 8-bit character encoding used mainly on **IBM mainframe** and **IBM midrange computer operating systems**.

15. An image editing software in which we can draw and edit images is?

- A. PageMaker                B. MS-Paint  
C. Coral Draw                D. Photo Image  
E. Front page

**Ans: (C) Corel Draw** is a vector graphics editor. A **vector graphics editor** is a computer program that allows users to compose and edit vector graphics images interactively on a **computer**.

16. In DOS, Which of the following command is used to delete all the files as well as sub directories of a directory?

- A. Delete                      B. Del  
C. Deltree                      D. Move  
E. None of

**Ans: (C) De tree** command is used to **delete** all the files as well as sub-directories of a directory.

17. Physical components that make up your computer are known as\_\_\_\_\_.

- A. Software                    B. Operating Systems  
C. Hardware                  D. Web Browsers  
E. None of these

**Ans: (C) The most common hardware** components are Monitor, Keyboard, Mouse, CPU etc.

18. In MS- Word WYSIWYG stands for\_\_\_\_\_?

- A. Preview                    B. What you see is what you get  
C. What you see is where you get  
D. Print                        E. None of these

**Ans: (B) WYSIWYG** is an acronym for "**What you see is what you get**".

19. Which of the following is suitable after you install new drivers?

- A. Shut Down                B. Restart  
C. Sleep                        D. Hibernate  
E. None of these

**Ans: (B) Restart** is suitable after you install new drivers.

20. Which of the following cannot be shared?

- A. Printer                      B. Scanner  
C. Plotter                      D. Mouse  
E. None of these

**Ans (D) Mouse** is a **pointing device** that detects two-dimensional motion relative to a surface.

**Mouse** cannot be shared.

21. A terabyte comprises\_\_\_\_\_.

- A. 1025 byte
- B. 1024 byte
- C. 1024 bits
- D. 1024 gigabyte
- E. None of these

**Ans (D)** A **terabyte** (TB) is a measure of **computer storage** capacity approximately **1,024 gigabytes** (GB).

22. What does MICR stand for?

- A. Magnetic Ink character Register
- B. Magnetic Ink Code Reader
- C. Magnetic Ink Code Register
- D. Magnetic Ink character Recognition
- E. Magnetic Ink cases Reader

**Ans: (D) Magnetic Ink Character Recognition** (MICR) is a character-recognition technology used mainly by the banking industry to ease the **processing** and clearance of **cheques** and other documents.

23. Virtual memory is\_\_\_\_\_?

- A. Memory on the hard disk that the CPU uses an extended RAM
- B. Access the page table
- C. CPU generates a physical address
- D. Automatic storage allocation
- E. None of these

**Ans (A) Virtual memory** is a feature of an **operating system** (OS) that allows a computer to compensate for shortages of physical memory by temporarily transferring pages of data from **random access memory** (RAM) to **disk storage**.

24. In DVD, V stands for\_\_\_\_\_.

- A. Video
- B. Versatile
- C. Both A and B
- D. V latile
- E. None of these

**Ans (B) DVD** (digital **ve** **satile** disc or digital **video** disc) is a digital optical disc storage format, invented and developed by Philips, **Sony**, **Toshiba** and **Panasonic** in 1995.

25. What is the full form of SIM?

- A. Station Identity Module
- B. System Identity Module
- C. Subscriber Identity Module
- D. Subscriber Trunk Dialling
- E. None of these

**Ans (C)** A **Subscriber Identity Module** card is a portable memory chip, that enables you to make

**phone calls** from any corner of the Globe, where you get the subscriber's Network.

26. Who among the following has coined The term 'Multimedia' ?

- A. Bob Goldstein
- B. Tay Vaughan
- C. NASA
- D. Mc Graw Hills
- E. None of these

**Ans (A)** The term **multimedia** was coined by singer and artist **Bob Goldstein** to promote the **July 1966** opening of his "**LightWorks t L'Oursin**" show at **Southampton**, Long Island.

27. What is GIS stands for

- A. Geological Information System
- B. Genetics Information Systems
- C. Geographic Information Systems
- D. Gene Information systems
- E. None of the e

**Ans (C)** A **geographic information system** (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or **geographical data**.

28 A\_\_\_\_\_is a software program used to view Web pages.

- A. Site
- B. Host
- C. Link
- D. Browser
- E. None of these

**Ans (D)** A **browser** is a software application used to locate, retrieve and display **content** on the **World Wide Web**, including **Web pages, images, video** and **other files**.

29. Micro-programming introduced by\_\_\_\_\_?

- A. John Mauchley
- B. Maurice Wilkies
- C. William Shockley
- D. Blaise pascal
- E. None of these

**An (B)** In 1951, **Maurice Wilkies** was developed the concept of **microprogramming** from the realization that the **Central Processing Unit** of a computer could be controlled by a miniature, **highly specialised computer program** in high-speed ROM.

30. On color monitor each pixel is composed of\_\_\_\_\_.

- A. two mini dots
- B. five mini dots
- C. six mini dots
- D. three mini dots
- E. None of these

**Ans (D)** On **color monitors**, each pixel is actually composed of **three dots a red, a blue and a green** one.

31. Numbers and formulae entered in a cell are called \_\_\_\_\_.

- A. Labels  
B. Numeric entries  
C. Intersection  
D. Text  
E. Fellers

**Ans (B)** When **entering numbers** in a **cell** the spreadsheet interprets the **data** as being numbers, which makes the use of mathematical formulas on the data possible. **By default** the data recognized as being numbers will be **right justified** in the cell.

32. Fax machines are used to send documents through a?

- A. Telephone line  
B. Modems  
C. Co-axial wire  
D. All of these  
E. None of these

**Ans (A)** Fax is the **telephonic transmission** of scanned printed material normally to a telephone number connected to a printer or other output device.

33. Date and time are available on the desktop at\_\_\_\_\_.

- A. Keyboard  
B. Recycle bin  
C. My computer  
D. Task bar  
E. None of these

**Ans (D)** A **taskbar** is an element of a **graphical user interface**. It shows which programs or applications are running on the device as well as provide links or shortcuts to other programs or places, such a **start menu, notification area** and **clock**.

34. To save an existing file with new name at a new location we should use \_\_\_\_\_ command.

- A. Save  
B. Save and replace  
C. Save as  
D. New file  
E. None of these

**Ans (C)** Choosing "**Save As**" brings up a prompt to save your work as a **file** with a different name. **Just be sure to rename** the file **something new** when you choose "**Save As**" or you will overwrite the current saved version.

35. You can use \_\_\_\_\_ to copy selected text and \_\_\_\_\_ to paste it in a document.

- A. ctrl+c, ctrl+ v  
B. ctrl+ c, ctrl+p  
C. ctrl+ s, ctrl+z  
D. shift+ c, alt+ p  
E. ctrl+d , ctrl+a

**Ans (A)** We can use **ctrl+c** to **copy** selected text and **ctrl+v** to **paste** it to the document.

36. A red wavy line under a word indicates that the word\_\_\_\_\_.

- A. Is too long for the line of text  
B. Is not in the dictionary file and therefore might be spelt incorrectly  
C. Is not appropriate for that particular sentence  
D. Is a verb  
E. None of these

**Ans (B)** **MS word** can check the text for **correctness** and allows you to make **amends**. If there is a **spelling mistake**, the **word** gets **underlined** with a **red color line** indicating the **error**.

37. Windows xp, windows 7, windows 8.1 are known as what?

- A. Processors  
B. Domain names  
C. Modems  
D. Operating system  
E. None of these

**Ans (D)** An **operating system** is system software that manages **computer** hardware and software resources and provides **common services** for computer programs.

38. \_\_\_\_\_ is when the more power-hungry components, such as the monitor and the hard drive are put in idle.

- A. Hibernation  
B. Power down  
C. Standby mode  
D. The shutdown procedure  
E. None of these

**Ans (C)** When **electronic devices** are receiving power but are not running, they are in **standby mode**. A **computer** in **standby mode** requires a small amount of current called a "**trickle charge**" that keeps the current state of running software saved in the computer's RAM.

39. Video-conferencing requires a microphone, speakers and a \_\_\_\_ attached to your computer.
- A. Mouse                      B. Keyboard  
C. Video camera              D. Scanner  
E. Light pen

**Ans (C) Video-conferencing** is a set of **telecommunication** technologies which allow two or more locations to communicate by simultaneous two-way video and audio transmissions. For a videoconferencing system **video camera, computer monitor, television, projector** is required.

40. Which of the following is an operating system?
- A. Linux                              B. Debugger  
C. Mozilla                          D. Google chrome  
E. Intel 8085

**Ans (A) Linux** is a **Unix-like** computer **operating system** assembled under the model of **free** and **open-source** software development and distribution.

41. What is Dr. Watson?
- A. IT Expert                      B. Application Debugger  
C. Surgeon                        D. Operating system  
E. None

**Ans (B) Dr. Watson** is an application debugger included with the Microsoft Windows operating system.

42. Which of the following cables can transmit data at high speeds?
- A. Flat cables                      B. Coaxial cable  
C. Optic fiber cable              D. Twisted pair cable  
E. UTP cable

**Ans (C) A fiber optic cable** consists of a bundle of **glass** threads, each of which is capable of **transmitting** messages modulated onto **light waves**.

43. Which of the following is not a binary number?
- A. 11101                          B. 110  
C. 233                              D. 1001  
E. 10010

**Ans (C) A binary number** is a number expressed in the **binary numeral system** which represents numeric values using two different symbols, typically **0** and **1**.

44. What does the computer abbreviation MB used for?
- A. Mega Bit                      B. Million Bytes  
C. Mega Bytes                  D. Million Bit  
E. Micro Bytes

**Ans (C) The megabyte** is a multiple of the **unit byte** for digital information. Its recommended **unit** symbol is **MB**.

45. What is the base of hexadecimal number system?
- A. 2                                  B. 8  
C. 16                                D. 10  
E. None of these

**Ans (C) The hexadecimal numeral system**, is a numeral system made up of 16 symbols (base 16).

46. RTGS stand for\_\_.
- A. Real Time Gross Settlement  
B. Real Time General Settlement  
C. Run Time Gross Settlement  
D. Regular Time General Settlement  
E. None of these

**Ans (A) Real-time gross settlement (RTGS)** systems are specialist **funds transfer systems** where transfer of money or securities **takes place** from **one bank** to another on a "**real time**" and on "**gross**" basis.

47. What is the name given to the temporary storage area that a web browser uses to store pages and graphics that it has recently opened?
- A. Niche                              B. Webspace  
C. Cache                              D. Cellar  
E. None of these

**Ans (C) Images** are often stored in a **cache** so the next time you request for that **image** it is obtained locally rather than from the **website**.

48. Oracle is an example of \_\_\_\_ application software.
- A. Database                        B. Word processing  
C. Project management          D. Presentation graphics  
E. Desktop

**Ans (A) Database** software tools are **primarily** used for **storing, modifying, extracting** and **searching** for information within a **database**.

49. MySQL is\_\_?
- A. a hierarchical model              B. a RDBMS  
C. a relational model              D. a database scheme  
E. None of these

**Ans (B) MySQL** is a **relational database management system (RDBMS)**. It was the world's



second most widely used RDBMS and the most widely used **open-source** RDBMS.

50. Primary key is a\_\_\_\_\_?

- A. Common key
- B. Unique key
- C. Input key
- D. Output key
- E. None of these

**Ans (B)** A **primary key** is a key in a **relational database** that is **unique** for each record. It is a unique identifier, such as a **driver license number**, **telephone number** or **vehicle identification number** (VIN). A relational database must always have one and only **one primary key**.

51. Which of the following computer language is a mathematically oriented languages used for scientific problems?

- A. FORTRAN
- B. COBOL
- C. LISP
- D. PROLOG
- E. APPLE

**Ans (A)** **FORTRAN** is used for scientific & Engineering while **COBOL** is oriented language commercial and PROLOG is a general purpose **logic programming language** associated with artificial intelligence and computational linguistics.

52. Which of the following is NOT a computer programming language?

- A. C
- B. C++
- C. Java
- D. COBOL
- E. Microsoft

**Ans (E)** C, C++, Java, COBOL are the computer **programming languages** while **Microsoft** is an **application software**.

53. Which of the following is not an operating system?

- A. DOS
- B. UNIX
- C. MAC(OS)
- D. DBMS
- E. Windows XP

**Ans (D)** **Operating system** is a **system software** that manages **computer hardware** and **software** resources and provides common services for computer programs.

54. One nibble is equal to how many bits?

- A. 4 bits
- B. 8 bits
- C. 12 bits
- D. 16 bits
- E. None of these

**Ans (A)** In computing, a **nibble** is a **four-bit** aggregation. It is also known as **half-byte**.

55. Verification of a Login name and password is known as\_\_\_\_\_.

- A. Configuration
- B. Accessibility
- C. Authentication
- D. Logging in
- E. None of these

**Ans (C)** **Authentication** is the process of **identifying** an individual, usually based on a **login name** and **password**.

56. Which of the following can be used to select the entire document?

- A. Ctrl+A
- B. Alt+F5
- C. Shift+A
- D. Ctrl +K
- E. Ctrl+H

**Ans (A)** For **selecting** entire document we use **Ctrl+ A**.

57. Which of the following will you require to hear music on your computer?

- A. Video Card
- B. Sound Card
- C. Mouse
- D. Joy Stick
- E. None of these

**Ans (B)** A **sound card** is used to **generate** sound and **provides** audio output to external devices like **speakers** and **headphones**.

58. What is the meaning of OSI, in terms of computers?

- A. Open Software Interrelation
- B. Open System Interrelation
- C. Open System Interconnection
- D. Open Software Interconnection
- E. None of these

**Ans (C)** The **Open Systems Interconnection** (OSI) model is a conceptual model that **characterizes** and **standardizes** the communication functions of **computing system** without regard of their underlying **internal structure** and **technology**.

59. Father of 'C' programming language\_\_\_\_\_.

- A. Dennis Ritchie
- B. Prof Jhon Kemeny
- C. Thomas Kurtz
- D. Bill Gates
- E. None

**Ans (A)** **Dennis Mac Alistair Ritchie** was an American computer scientist. He created the **C programming language**.

60. Which of the following is not a method of accessing the web?

- A. modem                      B. ISDN  
C. DSL                          D. CPU  
E. None of these

**Ans (D) CPU** (central Processing Unit) is a **part** of the **computer**. All the others can be used to **access** the net.

61. Yahoo (www.yahoo.com) is a\_\_\_\_\_.

- A. Website for Consumers  
B. Portal  
C. Organization that allocates web addresses  
D. Super Computer  
E. None of these

**Ans (B) Yahoo** is one of the **largest portals** in the **world**. A portal is a **website** intended to be a **starting point** for exploring and searching the **www**.

62. Time during which a job is processed by the computer is\_\_\_\_\_.

- A. Execution Time          B. Delay Time  
C. Real Time                D. Waiting Time  
E. None of these

**Ans (A) Time during** which a **job** is processed by the **computer** is **Execution Time**.

63. Internet Explorer is a\_\_\_\_\_.

- A. Web Browser              B. Graphing Package  
C. News Reader              D. Any person browsing the net  
E. None of these

**Ans (A) Internet Explorer** (IE) is the most common **web browsers**. **Web Browser** is a program that you use to surf the internet.

64. USB in data cables stands for?

- A. Unicode smart Bus      B. Universal structural Bus  
C. Unicode Serial Bus      D. Universal serial Bus  
E. None of these

**Ans (D) Universal Serial Bus** (USB) is an industry standard **developed** in the mid-**1990s** that defines the cables, connectors and communications protocols used in a bus for connection, communication, and **power supply** between **computers** and **electronic devices**.

65. You must install a (n)\_\_\_\_\_on a network if you want to share a broadband Internet connection.

- A. router                      B. modem  
C. node                        D. cable  
E. None of these

**Ans (A) A router** is a device that forwards data packets along networks. A **router** is connected to at least two networks. Routers are located at gateways, the places where two or more networks connect.

66. To reload a web page, press the\_\_\_\_\_button.

- A. Redo                        B. Reload  
C. Restore                    D. Ctrl  
E. Refresh

**Ans (E) In general refresh** is another way of saying **reload** or updating what is being displayed in **web page**.

67. \_\_\_\_\_mouse uses laser rays for the movement of cursor

- A. Mechanical mouse      B. Optical mouse  
C. Magnetic mouse        D. Normal mouse  
E. None of these

**Ans (B) An optical computer mouse** uses only a **light source**, typically a **laser** and a light detector, such as an array of photodiodes to detect movement relative to a surface.

68. Full form of PSU which is an internal component used to supply the power.

- A. Power supply unit  
B. Permanent supply unit  
C. Placement supply unit  
D. Programmable supply unit  
E. None of these

**Ans (A) A power supply unit** (PSU) converts mains AC to **low-voltage** regulated **DC power** for the internal components of a computer. Modern personal computers universally use a **switched-mode power** supply.

69. Disk access times are measured in\_\_\_\_\_?

- A. minute                      B. Milliseconds  
C. Hours                        D. seconds  
E. None of these

**Ans (B) Disk access times** are measured in **milliseconds**, often abbreviated as ms.



numbers. The **elements of records** may also be called fields or members.

81. A \_\_\_\_\_ is a grid with labeled columns and rows.

- A. Dialog box
- B. Worksheet
- C. Clipboard
- D. Toolbar
- E. None of these

**Ans (B)** An Excel **worksheet** is a single spreadsheet that contains cells organized by **rows** and **columns**.

82. An example of a telecommunication device is a \_\_\_\_\_.

- A. Keyboard
- B. Mouse
- C. Modem
- D. Printer
- E. Scanner

**Ans (C)** **Modem** is one that turns the **digital data** of a computer into **modulated electrical signal** for transmission over **telephone lines** and demodulated by another **modem** at the receiver side to recover the **digital** data.

83. Programs that automatically submit your search request to several search engines simultaneously are called \_\_\_\_\_.

- A. Metasearch engines
- B. Webcrawlers
- C. Spiders
- D. Hits
- E. None of these

**Ans (A)** **Metasearch engine** is a search tool that uses another search engine's data to produce their own results from the Internet.

84. What kind of Protocol is used to provide internet access from mobile?

- A. TCP/IP
- B. ISD
- C. WAP
- D. HTTP
- E. None of these

**Ans (C)** **WAP** (Wireless Application Protocol) is a **technical standard** for accessing information over a **mobile** wireless network.

85. What is the slowest transmission medium?

- A. Twisted pair wire
- B. Coaxial cable
- C. Fibre optic cable
- D. All of above
- E. None of these

**Ans (A)** **Twisted pair wire** is the most widely used but slowest medium for telecommunication. It consists of **copper wires** that are twisted into pairs. The **transmission speed** ranges from **2 million bits per second** to **10 billion bits per second**.

86. What is an e-mail attachment?

- A. A receipt sent by the recipient
- B. A separate document from another program sent along with an e-mail message
- C. A malicious parasite that feeds off of you messages and destroys the contents
- D. A list of CC and BCC recipients
- E. None of these

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

87. The \_\_\_\_\_ program compresses large files into a smaller file.

- A. WinZip
- B. WinShrink
- C. WinStyle
- D. Microsoft
- E. None of above

**Ans (A)** **WinZip** is a program that lets you archive and compress files so that you can store or distribute them more efficiently.

88. The \_\_\_\_\_ folder retains copies of message that you have started but are not yet ready to send.

- A. Inbox
- B. Outbox
- C. Drafts
- D. Sent Items
- E. Address Book

**Ans (C)** A **draft** is simply an **email message** you haven't yet sent. It's not the same thing as an email waiting to be sent.

89. Which is not an internet protocol?

- A. HTTP
- B. FTP
- C. STP
- D. UDP
- E. None of these

**Ans (C)** The **Internet Protocol** (IP) is the principal communications protocol in the Internet protocol suite for relaying datagrams across network boundaries. Some protocols are TCP, IP, UDP, POP, SMTP, HTTP, FTP.

90. What kind of server converts IP addresses to domain names?

- A. DNS
- B. MNS
- C. UTP
- D. RTP
- E. None of these

**Ans (A)** The **Domain Name System** (DNS) is a hierarchical distributed **naming system** for computers, services, or any resource connected to the Internet or a private network.

91. POST stands for\_\_\_\_\_.

- A. Power On Selfie Test
- B. Power One Self-Test
- C. Power On Self-Test
- D. Power On Self-Testing
- E. None of these

**Ans (C)** The first thing that the BIOS does when it boots the PC is to perform what is called the **Power-On Self-Test**. The POST is a built-in diagnostic program that checks your hardware to ensure that everything is present and functioning properly, before the BIOS begins the actual boot.

92. Which of the following is a network in which computers are located physically close together, often in the same building?

- A. LAN
- B. WAN
- C. RAM
- D. ROM
- E. None of these

**Ans (A)** A **local area network (LAN)** is a computer network that interconnects computers within a limited area such as a residence, school, laboratory, or office **building**.

93. Programs such as Mozilla Firefox that serve as navigable windows into the Web are called\_\_\_\_\_.

- A. Internet
- B. Data card
- C. Web browsers
- D. RAM
- E. None of these

**Ans (C)** **Mozilla Firefox** is a free and open-source **web browser** developed by the **Mozilla Foundation** and its subsidiary, the Mozilla Corporation.

94. Start or restart the computer means\_\_\_\_\_.

- A. exit
- B. kick
- C. boot
- D. kick start
- E. None of these

**Ans (C)** Boot means start (a computer) and put it into a state of readiness for operation.

95. You click at B to make the text\_\_\_\_\_.

- A. Italics
- B. Underlined
- C. Italics and under lined
- D. Bold
- E. None of these

**Ans (D)** If i click at **B** it makes the text **Bold**.

96. Each\_\_\_\_\_on a menu performs a specific action.

- A. Client
- B. Server
- C. Node
- D. Command
- E. None of these

**Ans (D)** **Command** is a directive to a **computer program** acting as an interpreter of some kind in order to perform a specific task.

97. An e-mail address typically consists of a user ID followed by the\_\_\_sign and the name of the e-mail server that manages the user's electronic post office box.

- A. @
- B. #
- C. &
- D. \*
- E. None of these

**Ans (A)** An **e-mail** address typically consists of a user ID followed by **@ sign** and the name of the **e-mail server** that manages the user's **electronic post office box**.

98. \_\_\_\_\_are devices used to transmit data over telecommunications lines.

- A. Drives
- B. Drives bays
- C. Modems
- D. Platform
- E. None of these

**Ans (C)** A **modem** is a device that **modulates** signals to **encode** digital information and **demodulates** signals to **decode** the transmitted information. This device used to transmit data over telecommunication.

99. What is the file extension of MS-Power point?

- A. .exe
- B. .xls
- C. .ppt
- D. .pst
- E. None of these

**Ans (C)** **.ppt** is a **file extension** for a presentation file format used by **Microsoft PowerPoint**, the popular **presentation** software commonly used for office and educational slide shows.

100. \_\_\_\_\_The information stored in the catalog is called\_\_\_\_\_.

- A. Meta-data
- B. Mini-world
- C. Record
- D. All of these
- E. None of these

**Ans (A)** The system **catalogs** are the place where a **relational database management system** stores schema **metadata**, such as information about **tables** and **columns** and internal **book keeping** information.



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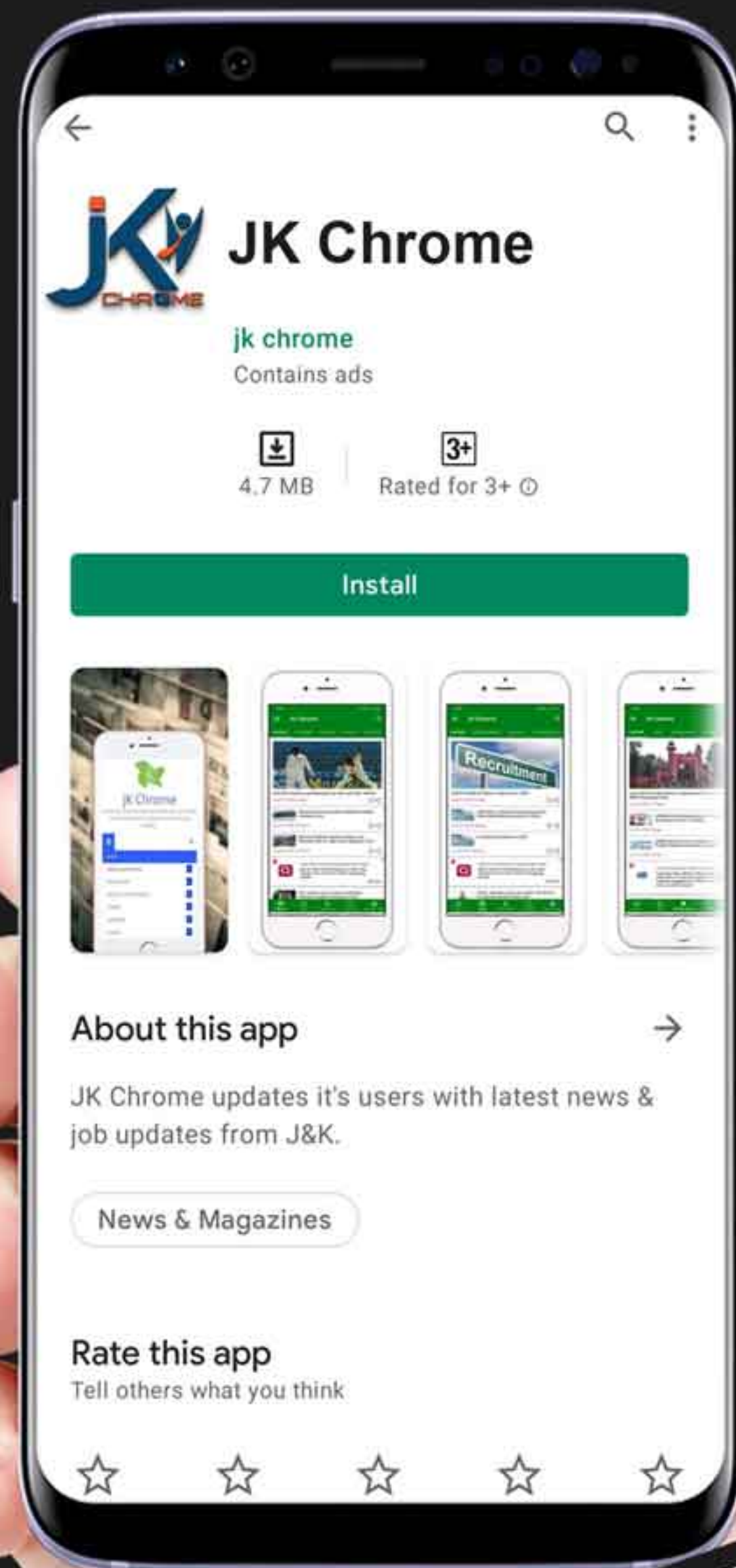
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