CHAPTER 4 The Basic Computer Architecture

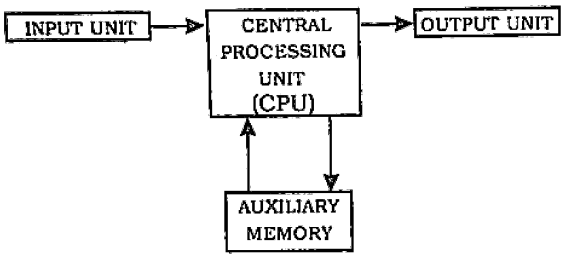
This chapter deals with providing an overview the internal components of digital computers.

COMPONENTS OF A DIGITAL COMPUTER

A digital computer can be broadly classified as a collection of four components. They are :-

1. Input unit
2. Output unit
3. Central Processing Unit
4. Memory (auxiliary)

A block diagram representation of the above is shown in the figure :



Basic Components of a digial computer

THE INPUT UNIT

The Input Unit provides an interface between the users and the machine, for inputing data and instruction etc. One of the most common examples is the keyboard. Data can be input in many more forms-audio, visual, graphical etc.

Some common input devices are listed below:

1. Keyboard
2. Mouse
3. Voice data entry
4. Joystick
5. Light pen
6. Scanner
7. Secondary storage devices such as floppy disks, magnetic tapes etc.

The data in any form is first digitized i.e., converted into binary form, by the input device before being fed to the Central Processing unit (CPU).

THE OUTPUT UNIT

Like the Input Unit, the Output Unit also provides an interface between the user and the machine. A common example is the visual display unit (monitor) of a personal computer. The output unit receives the data from the CPU in the form of binary bits. This is then converted into a desired form (graphical, audio, visual etc.) understandable by the user.

Some common output devices. are:

(i) Visual Display Unit (Monitor)

(ii) Printers

(iii) Speakers

(iv) Secondary Storage Devices

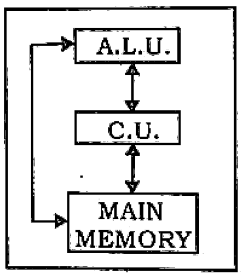
The input and output unit collectively are referred to as 'peripherals'

THE CENTRAL PROCESSING UNIT

The Central processing unit is the brain of the computer system. The input and output devices may vary for different application, but there is only one CPU for a particular computer. The specifications of a computer are basically characterized by its Central Processing Unit.

The central processing unit can be further divided into:

1. The Arithmetic Logic Unit (ALU)
2. The Control Unit
3. Main Memory



The arrows in the above figures may represent data as well as control information flow.

The CPU processes the data it receives as input (either through input devices or through the memory). The CPU receives the data in the form of binary bits, which it can understand.

The CPU performs many tests, some of which are listed below :

1. The CPU can perform arithmetic calculations such as addition, subtraction etc.
2. The CPU can perform logical decisions.
3. The CPU with the help of other devices can perform data transmission.
4. The CPU can perform manipulating tasks such as word processing.
5. After performing the required task the CPU may place results in memory or send results to the output device according to the instruction given to it.

6. The CPU with the help of its control unit generates timing signals (also known as enable signals) which provide synchronization between the different devices and the CPU.

As mentioned earlier, the central processing unit consists of :

1. The Arithmetic Logic Unit (ALU)
2. The Control Unit
3. The Main Memory Unit

THE ARITHMETIC LOGIC UNIT (ALU)

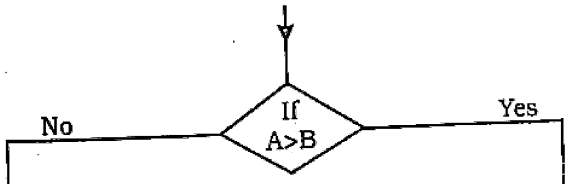
As the name may indicate the arithmetic logic unit performs all arithmetic and logic calculations on the data it receives.

ARITHMETIC CALCULATIONS

The arithmetic calculations may be addition, subtraction, multiplication, division, exponentiation etc.

LOGICAL CALCULATION

Logical calculations are basically decision making statements for example, A>B, decides whether A is greater than B or not; If A is greater than B the statement is true and logical '1' would be generated, otherwise a logical 'O' would be generated. Some logical decisions decide the further routing of the program. This will be further explained by the figure :



Part of a Flow Chart

In the above figure the decision box has split the flow chart into two.

The functioning of the arithmetic logic unit would be better understood when we discuss the 'accumulator'.

THE CONTROL UNIT

The Control unit controls the entire operations of the computer and the CPU. It controls all the other devices connected the CPU, i.e. Input devices, Output devices, Auxiliary Memory etc. Hence, the control unit acts as the nerve centre of the computer.

The control unit upon receiving an instruction decides what is to be done with it. That is, whether it is to be sent to the ALU for further processing or to the output devices or to the memory etc. In other words the control unit coordinates and controls all hardware operations.

The control unit has an electronic clock that transmits electronic pulses at equal intervals of time. The control unit gives instructions to other devices based upon these pulses. Suppose there are three instructions to be performed. Let the first instruction take three clock pulses to complete; when the fourth clock pulse is received the control unit would start processing the second instruction and so on. Suppose an instruction takes three and a half clock pulses to complete. In such a case the control unit could wait for the fourth clock pulse to complete and take up the next instruction with the fifth clock pulse.

The clock pulse basically provides synchronization between the different parts of the computer. The control unit generates millions of clock pulses per second. The speed at which an instruction is executed depends upon the clock speed which is in MHZ (10^6HZ).

THE MAIN MEMORY UNIT

The main memory also known as the primary memory is a part of the central processing unit and is a combination of both RAM (random access memory) and ROM (read only memory).

RAM

The random access memory is read write memory i.e. information can be read as well as written into this type of memory. It is volatile in nature, i.e., the information it contains is lost as soon as the system is shut down unless 'saved' for further usage by users. It is basically used to store programs and data during the computer's operation.

ROM

The read only memory as the name may suggest contains information that can only be read, i.e., you can't write on this type of memory. It is non-volatile or permanent in nature. It is basically used to store permanent programs such as program for the functioning of the monitor.

The main memory is a fast memory, i.e., it has small access time. It is because of its limited capacity that it is fast. The main memory contains the programs that are currently being worked on. It passes on this information to the control unit as and when required. In case the CPU wants to access some data that is present in a secondary storage device, this data is first transferred to the main memory and then processed.

The main memory is much more costly than the secondary storage devices. Although the ROM IC's of various computers do not vary much in their capacities, the RAM chips are available in wide ranges of storage capacities. In fact, the capacity of the random access memory is an important specification of a computer.

A larger RAM means larger programs (in terms of memory) can be loaded and executed. Suppose you want to run a 68-KB program on a machine with 64-

KB. This means that the whole program can not be loaded into the main memory at once resulting in either the non-execution of the program or a very slow execution.

A 64-K memory means that there are approximately 64000 (65,536 to be precise) storage location which can store 1 bit of data each.

Different memories can be classified on the basis of there concepts:

1. Access Mode : which means how easily they are accessible.

2. Access time : the average time required to reach a storage location and obtain its content is called access time.

3. Transfer Rate : the transfer rate is the number of characters or words that a device can transfer per second after it has been positioned at the beginning of the record.

4. Capacity and cost : the capacity and cost may depend upon the requirement and the budget.

The main memory has a very low access time and a very high transfer rate. It is limited in capacity and costlier than secondary storage devices.

THE CACHE MEMORY

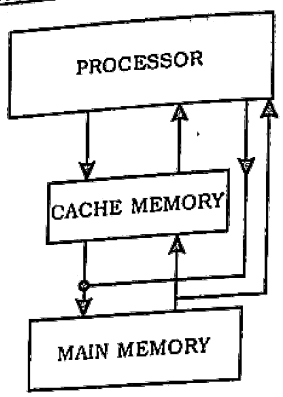
Another important concept is that of the cache memory, which is also a part of the CPU.

The cache memory lies in the path between the processor and the main memory. The cache memory therefore, has lesser access time than the main memory and is faster than the main memory. A cache memory may have an access time of 100ns, while the main memory may have an access time of 700ns.

The cache memory is very expensive and hence is limited in capacity. Earlier cache memories were available separately but the latest microprocessors contain the cache memory on the chip itself.

The need for the cache memory is due to the mismatch between the speeds of the main memory and the CPU. The CPU clock is very fast, whereas the main memory access time is comparatively slower. Hence, no matter how fast the processor is, the processing speed depends more on the speed of the main memory (the strength of a chain is the strength of its weakest link). It is because of this reason that a cache memory having access time closer to the processor speed is introduced.

The cache memory stores the program (or its part) currently being executed or which may be executed within a short period of time. The cache memory also stores temporary data that the CPU may frequently require for manipulation.



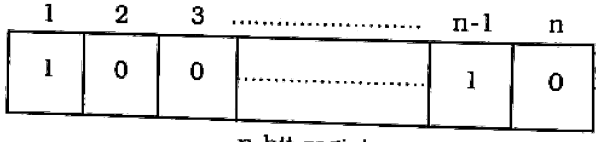
Cache Memory

The cache memory works according to various algorithms, which decide what information it has to store. These algorithms work out the probability to decide which data would be most frequently needed. This probability is worked out on the basis of past observation.

FUNCTIONING OF THE ARITHMETIC LOGIC UNIT

REGISTER

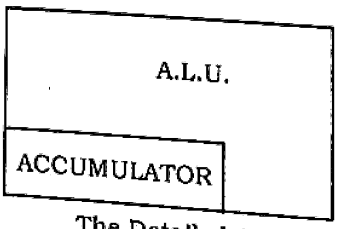
A register is a combination of memory storage locations called **flip-flops**. Each flip-flop is capable of storing one bit of information. An n-bit register contains 'n' flip-flops and is capable of storing 'n' bits of information.



n-bit register

ACCUMULATOR

The accumulator is a register that is present within the arithmetic logic-unit. The accumulator stores data, which is either the result of an operation, or which is to be processed through arithmetic and logical operations.



The Detailed A.L.U.

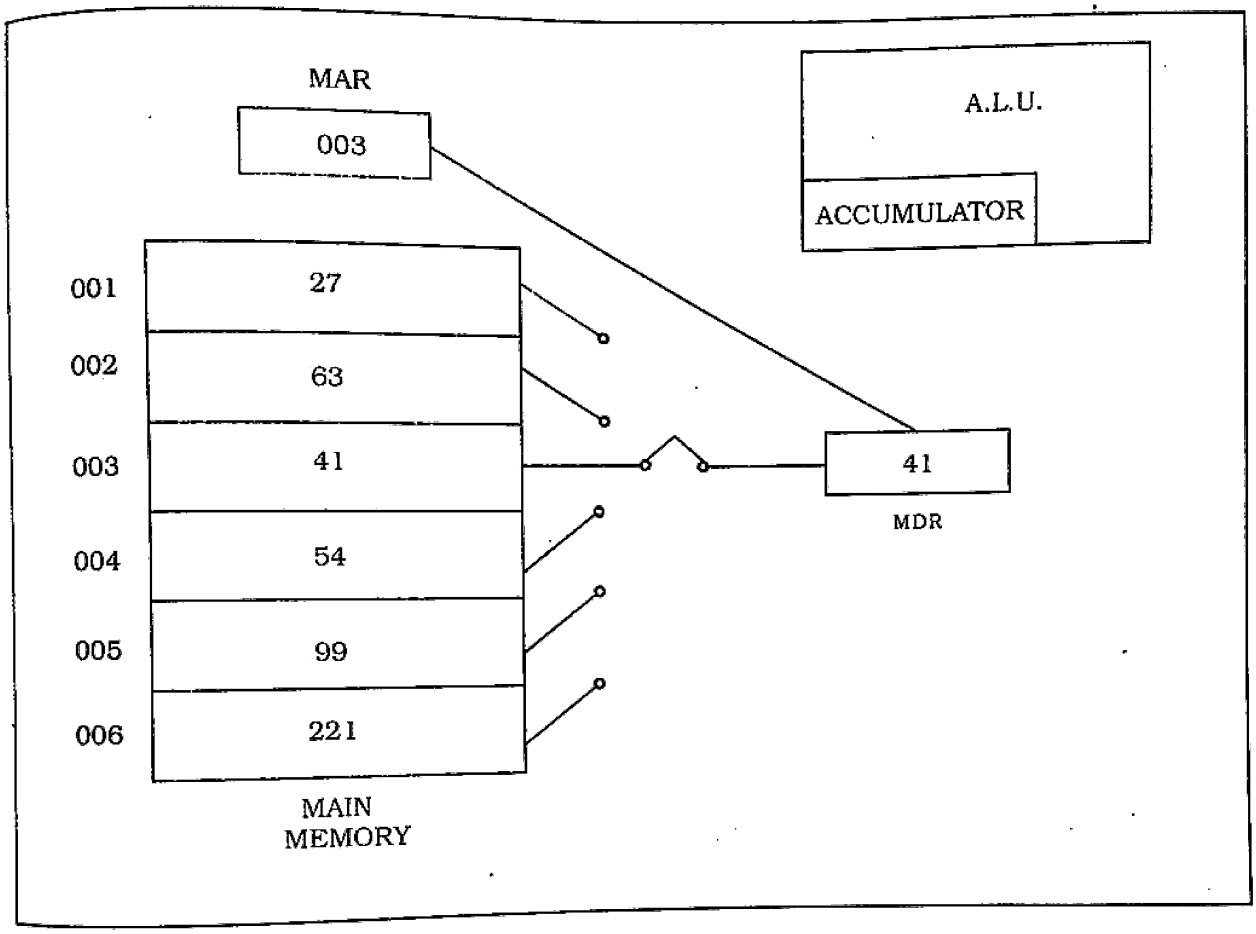
MEMORY DATA REGISTER

The memory data register like the accumulator is used to store data. This register holds all data and instructions temporarily as they pass in or out of the main memory.

MEMORY ADDRESS REGISTER

The memory address register contains the address of the memory location (in main memory) whose data is to be transferred into the memory data register.

In the figure, the memory address register (MAR) contains the address of the third memory location, the data of which is transferred to the memory data register (MDR).



FUNCTIONING OF THE CONTROL UNIT

The control unit is the nerve centre of the computer. Every instruction before being executed is first interpreted by the control unit. The sequence of operations involved in processing an instruction in known as the **instruction cycle.**

The instruction cycle can be divided into two parts :

1. Fetch cycle 2. Execution cycle

FETCH CYCLE

The control unit fetches the instruction from the memory data register and places it in the current instruction register.

EXECUTION CYCLE

The control unit then decodes this instruction in the current instruction register and sends the appropriate signal to the concerned device for the execution of the instruction.

COMPUTER HARDWARE

The term computer hardware refers to the various electronic components that are required for you to use a computer along with the hardware components inside the computer case. Computer equipment is made of several common components. These include :

- The main computer box.
- A monitor - Looks like a television screen.
- A keyboard.
- A mouse.
- Speakers.
- An optional printer

The main computer box is the main component of the computer. It has computer hardware parts inside that perform the following functions :

- Temporary storage of information (known as data in more technical terms) - This function is done by memory.
- Permanent storage of information - This function is done by a hard disk, floppy disk, or CD ROM.
- Manipulation or processing of data - Used to determine where data is stored and perform calculations which support operations that the user is doing.
- Interfacing to the outside components or to the outside world - This supports the ability for the user to communicate with the computer and know how the computer is responding to commands which are done primarily through the monitor, keyboard, and mouse along with their interface components in the main computer box.

A power supply which provides the electrical power to the components in the computer box.

THE MAIN COMPUTER BOX

The main computer box is made of several computer hardware components and subcomponents which include:

The case : The outside component which provides protection for the parts inside and provides a fan and power supply which are used to both cool the working parts inside and provide power to them.

The motherboard : Hold the following computer hardware subcomponents :

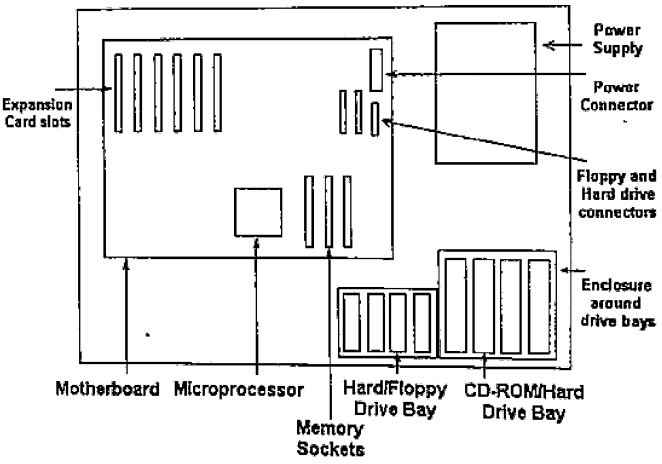
- Memory - Used to provide temporary storage of information as discussed earlier.
- Microprocessor - Used to provide the processing of data function.
- Video interface card which is also called the video card - This card is an interface between the computer monitor and the motherboard and its subcomponents such as the microprocessor and memory. This card may be included as part of the motherboard or it may plug into a card slot on the motherboard.
- Sound card is an interface between the computer speakers and the motherboard and its subcomponents such as the microprocessor and memory. This card may be included as part of the motherboard or it may plug into a card slot on the motherboard.

There are also other minor computer hardware components inside the case which include cables which may be used to hook other internal parts together along with connecting an interface to the case for printers and other devices such as a high speed serial bus called USB. (A serial bus simply refers to the fact that data is sent in a stream which is like sending one bit at a time.

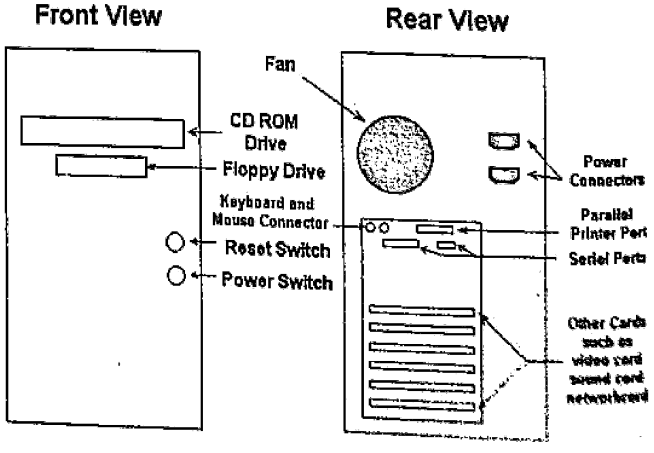
THE CASE

The drawing below shows a typical case. It may help you understand where your connections for your monitor, keyboard, mouse, and other devices are if you should need to hook them up.

Inside the Case

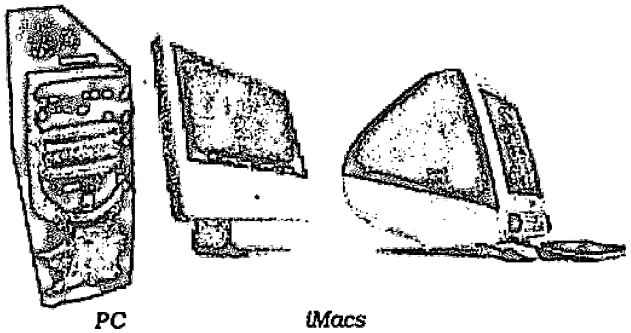


A Typical Computer with Tower Case



COMPUTERS

There are basically two types of computers; **PC's** and **Macs**. PC stands for "personal computer." Even though Macs are also personal computers, PC has come to refer to non-MacIntosh computers such as Dell, IBM, Gateway, HP, etc. PC's generally run Windows operating system while Mac's run Mac operating system. There are various versions of each. When you buy software, you must buy it for the operating system you have. Windows software runs on Windows and Mac software runs on Macs.



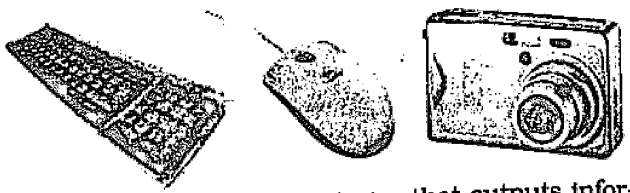
PC *iMacs*

Peripherals : A computer peripheral is any external device that provides input and output for the computer. For example, a keyboard and mouse are input peripherals, while a monitor and printer are output peripherals. Computer peripherals, or peripheral devices, are sometimes called "I/O devices" because they provide input and output for the computer. Some peripherals, such as external hard drives, provide both input and output for the computer

Input devices: An input device is any device that provides input to a computer. There are dozens of possible input devices, but the two most common ones are a keyboard and mouse. Every key you press on the keyboard and every movement or click you make with the mouse sends a specific input signal to the computer. These commands allow you to open programs, type messages, drag objects, and perform many other functions on your computer.

Some input devices

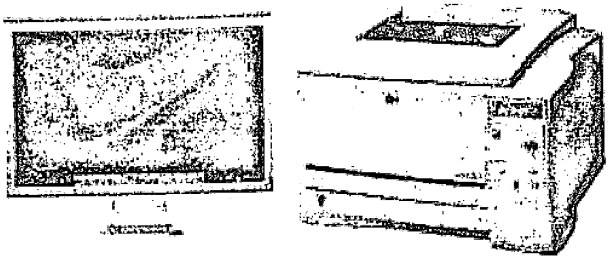
- Keyboard
- Mouse
- Microphone
- Joystick
- Scanner
- Thumb drive
- Digital camera (still or video)



Output devices : Any device that outputs information from a computer is called, not surprisingly, an output device. Since most information from a computer is output in either a visual or auditory format, the most common output devices are the monitor and speakers. These two devices provide instant feedback to the user's input, such as displaying characters as they are typed or playing a song selected from a play list.

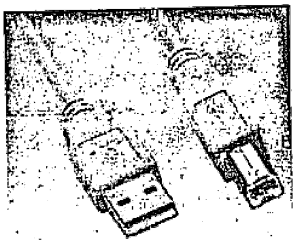
Some output devices

- Monitors
- Printers
- Speakers
- Projectors
- Headphones
- Robotic machines
- Lighting control systems
- Audio recording devices



Cables and Connections : Most peripherals are connected to the computer by a cable. There are different kinds of cables and connectors. Most cables can simply be plugged in to the computer using the correct port.

USB - Most cables today are USB. USB cables can have a couple of different connectors. The one given below is the most common type. You will find USB ports in the back or side of your computer, also sometimes on the monitor and keyboard.

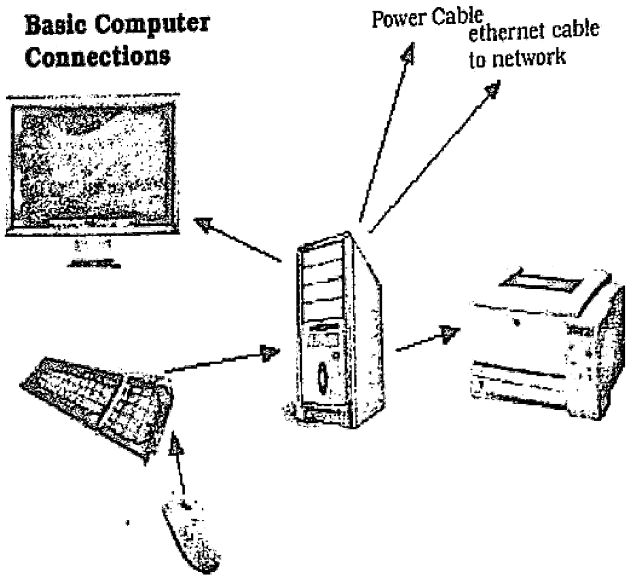


Firewire (IEEE) - Firewire is a high speed cable used primarily to transfer video from a digital video camera to a computer and vice versa.

Power Cord - In order for a computer to work, it obviously must have power which it gets by plugging in the power cord. The power cord plugs into the back of the computer, and then into a power outlet in the wall.

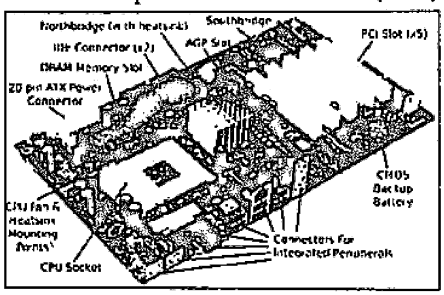
Ethernet Cable - Computers are connected to the network with Ethernet Cables. The connectors look like large phone cable connectors. They plug into the back or side of the computer and the other end into a wall or router jack. This is what allows the computer to get on the internet and communicate with other computers.

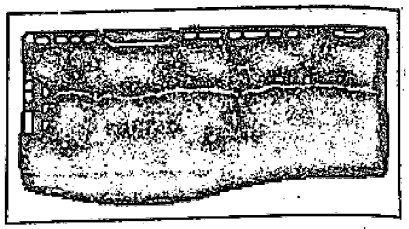
Category 5 Cable



Inside The Computer

Motherboard : In personal computers, a motherboard is the central printed circuit board (PCB) in many modern computers and holds many of the crucial components of the system, while providing connectors for other peripherals. The motherboard is sometimes alternatively known as the main board, system board, or, on Apple computers, the logic board. Motherboard, like a backplane, provides the electrical connections, by which the other components of the system communicate, but unlike a backplane, it also connects the central processing unit and hosts other subsystems and devices. A typical desktop computer has its microprocessor, main memory, and other essential components connected to the motherboard. Other components such as external storage, controllers for video display and sound, and peripheral devices may be attached to the motherboard as plug-in cards or via cables, although in modern computers it is increasingly common to integrate some of these peripherals into the motherboard itself. An important component of a motherboard is the microprocessor's supporting chipset, which provides the supporting interfaces between the CPU and the various buses and external components. This chipset determines, to an extent, the features and capabilities of the motherboard.





KeyBoard : As the name implies, a keyboard is basically a board of keys. Along with the mouse, the keyboard is one of the primary input devices used with a computer. The keyboard's design comes from the original typewriter keyboards, which arranged letters and numbers in a way that prevented the type-bars from getting jammed when typing quickly. This keyboard layout is known as the QWERTY design, which gets its name from the first six letters across in the upper-left-hand corner of the keyboard.

While the design of computer keyboards may have come from typewriters, today's keyboards have many other keys as well. Modifier keys, such as Control, Alt/Option, and Command (Mac) or the Windows key (Windows) can be used in conjunction with other keys as "shortcuts" to perform certain operations. For example, pressing Command-S (Mac) or Control-S (Windows) typically saves a document or project you are working on. Most of today's computer keyboards also have a row of function keys (F1 through F16) along the top of the keyboard, arrow keys arranged in an upside-down T, and a numeric keypad on the right-hand side. Some keyboards have even more buttons, allowing you to change the system volume, eject a CD, or open programs such as your e-mail or Web browser.

Function Keys (F keys): Most computer keyboards have a row of function keys at the top of the keyboard. These keys are marked F1 through F10 or F12. While they were widely used with older DOS programs, they are not as popular today. However many programs, including most of Microsoft's products, support use of the function keys. As a throwback to DOS days, you will find that the F1 key often will bring up a help menu. The function keys are frequently used in combination with other keys such as the CTRL key, the ALT key, and the Shift key. These combinations result in a plethora of possible keyboard shortcuts. Look in the help menu of the program that you are using to find a list of the function keys and their uses.

Return or Enter Key: This key is usually marked Return or Enter, but sometimes is labelled with only a large arrow. This key is used to enter commands or to move the cursor to the beginning of the next line. Also, in every dialog box or alert on both the PC and the Mac, there is a default button or box that is recognizable by its bold or segmented outline. Pressing the Enter key will select that choice. (There is sometimes a second Enter key on the numeric keypad. This functions exactly like the larger Enter key near the alphabet letters.)

Escape Key: The Escape key, which is marked ESC on most keyboards, is basically used to exit or escape from programs and tasks. In many cases, it will have no effect at all. However, it can sometimes get you out of trouble by making the computer go back or escape to a previous screen.

Control Key (CTRL): The CTRL key is used in conjunction with another key. Holding it down while pressing another key will initiate a certain action. CTRL key combinations are defined by the application being used. Some, however, have become a standard that most programs follow. For instance in most Windows programs, CTRL+S will save the current file or document, and CTRL+P will print the current file or document. Macintosh keyboards have a Control key that is used only sparingly in Mac programs. It is included on the Mac keyboard basically for users who may run Windows and DOS-based programs on their Macs.

Alternate Key (ALT): Like the Control Key, the ALT key is used in combination with other keys. In most Windows programs, each of the menu choices at the top of the screen has one letter underlined. Holding down the ALT key while pressing the key corresponding to the underlined letter will open the menu just as though you had clicked your mouse on that menu choice. For instance, if the menu shows the choice File, you can open that menu by clicking the mouse on the word File or by pressing the ALT key and the F key simultaneously.

Caps Lock: The Caps Lock key is a toggle key. Pressing it once turns it on. Pressing it again turns it off. Some computer keyboards have a light or indicator that shows when the Caps Lock is on and when it is off. When Caps Lock is on, every letter that is typed will be a capital letter. Unlike a typewriter, the Caps Lock key on a computer keyboard affects only letters. It has no effect on the number or symbol keys.

Num Lock & Numeric Keypad: Many, but not all, computer keyboards have a numeric keypad usually located on the right side of the keyboard. This keypad has a group of number keys with additional markings like arrows, PgDn, End, etc. The numeric pad is controlled by a toggle key marked Num Lock. When the Num Lock key is on, this pad can be used to enter numbers. When the Num Lock key is off, the functions listed below the number will be activated. These functions usually include arrow keys that can be used to move the cursor around the screen. Likewise the keys marked PgUp and Pg Down will move the cursor a page up or down on the screen. The Home and End keys will move the cursor to the beginning or end of a line or document, respectively.Numeric keypads often include other keys as well. Many include useful symbols such as the period, slash, and plus and minus signs.

Mouse : In computing, a mouse is a pointing device that functions by detecting two-dimensional motion relative to its supporting surface. Physically, a mouse consists of an object held under one of the user's hands, with one or more buttons. It sometimes features other elements, such as "wheels", which allow the user to perform various system-dependent operations, or extra buttons or features that can add more control or dimensional input. The mouse's motion typically translates into the motion of a cursor on a display, which allows for fine control of a graphical user interface.

Personal Computer Ports : A port is a connector or slots usually in the back of the computer. There are several ports through which the computer interacts with the outside or the user. Some ports include: keyboard, monitor, serial, parallel, telephone, etc.

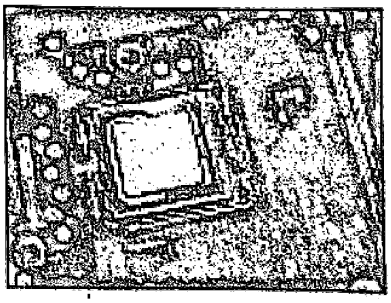
Parallel Port: A port which transmits and receives several bits of data at a time (typically 8 bits). Typically parallel port used to connect to printers.

Serial Port: A type of port that transmits only one bit at a time. In order to send a byte of data, the data has to be "turned on its side" and send out bit by bit. Used to connect hard disk, CD-Rom

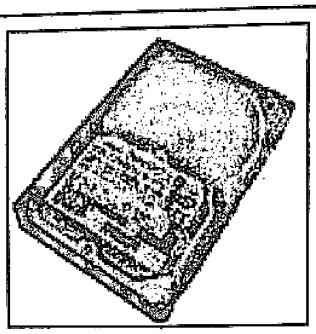
USB Port: Universal Serial Bus (USB) is a specification to establish communication between devices and a host controller (usually a personal computer). USB can connect computer peripherals such as mice, keyboards, digital cameras, printers, personal media players, flash drives, Network Adapters, and external hard drives. For many of those devices, USB has become the standard connection method.

PS/2 connector: The PS/2 connector is a 6-pin Mini-DIN connector used for connecting some keyboards and mice to a PC compatible computer system

Sound Ports: You use the sound ports to plug in sound devices, such as your speakers (the green-colour port on most new systems) and microphone (the pink-colour port). Some systems also have Line In and Line Out ports that you can use to connect the computer to external audio equipment.

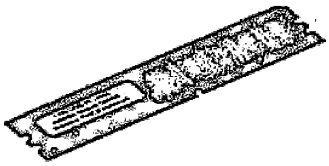


CPU : The CPU, or Centeral Processing Unit is the actual computer or brains of the computer. This is where the "computing" takes place.



Hard Drive: All computers have a hard drive. The hard drive (HD)is where everything is saved. Every program, every file or document is saved on the hard drive. Think of it as your file cabinet. Eventually, a hard drive may get full and nothing else can be saved unless some of the stuff on it is thrown away. One way to upgrade a computer is to buy a second or bigger hard drive. Hard drives are classified by the size or amount they can store. A typical hard drive may be 80 to 160 gigabytes. When you purchase a computer, you need to decide how big of a hard drive you want. If you are going to store a lot of video, music, or pictures, you will need a larger hard drive than if you are just going to use primarily word processing and email.

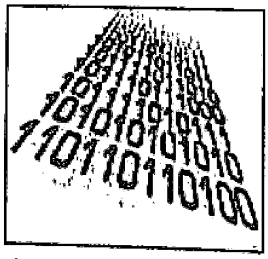
RAM (memory) : When we talk about the memory of a computer, we are talking about RAM , or Ramdon Access Memory. RAM is your temporary working space. This is where you do your work. but it is temporary. If you don't save your work back to your hard drive, you will lose your work. (this is why when your computer freezes and have to restart, you lose your work).



The more RAM your computer has, the better it will run and the more programs you can have open at the same time. It also assures you can open the programs that take up more memory.

There is another way to upgrade your computer; buying and installing additional memory. The minimum amount of memory a new computer should have is at least 512 megabytes to 1 gigabyte.

Bytes : We us Bytes as unit of measurement used to indicate how much memory information will take up. Bytes is the root word, prefixes are added to it to change it's value;



(K) kilo = 1000

(M) mega = million

(G) giga = billion

1KB = 1,000 bytes

1MB = 1,000,000 (1 million) bytes = 1000kb

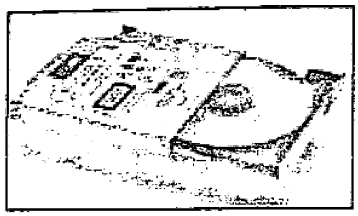
1GB = 1,000,000,000(1billion) bytes =1,000MB

1TB = 1,000,000,000,000 bytes (1 trillion) bytes or 1000 GB

Every letter or number you type takes up 1 byte of space.

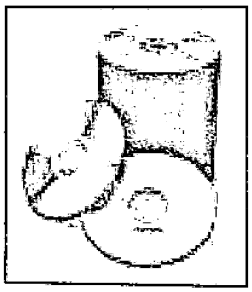
Removable Media : It is very important to make a Backup Copy of important files on your computer incase something happens to the orginials. There are various ways to do this, besides on-line backups and external hard drives, there are numerous removable media listed below that can be used;

CD Burner or CD-RW : Most computers these days have CD Burners or writers which allow you to buy blank CD's and copy or "burn" the files, documents, programs, etc onto the CD. There are a few more steps involved than just copying files, but it is very simple. Unless you have a rewriteable CD, once you burn it, you can not change it or add to it.Blank CD's will hold about 700 megabytes of information. CD's are great for backing up files, which is a very important thing to do incase something happens to your computer. Documents, pictures, music, etc should all be backed up to some other location.

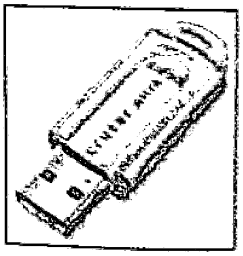


CD ROM : stands for Compact Disk- Read Only Memory, which means you can only read what is on the CD, you can't change or delete it. When something is burned on a disk, it's more or less permanent.

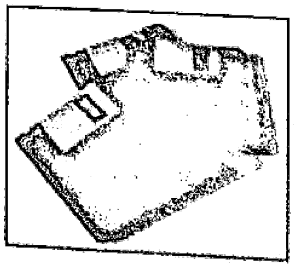
DVD Burner : Many newer computers now come with a DVD Burner which is very similar to the CD Burner above, but it will also burn blank DVD's the same way. The advantage of burning DVD's is that they can hold a lot more information. DVD's can hold about 5 gigabytes (6-7 CD's). If you are going to burn videos, you will need a DVD burner.

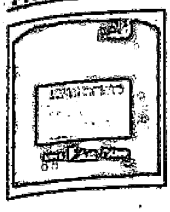


USB Flash Drives : Flash Drives, also known as thumb drives, pen drives, jump drives, etc are a very convenient way to copy, back up, or move files. They come in different sizes. All you have to do is plug the drive into any USB port and drag files on to the flash drive icon.



Floppy Disks : Floppy disk have pretty much become obsolete or out dated. Most people do not use them anymore because they do not hold very much information (1 megabyte) and are not very reliable. There are much better options for such as these other type of media listed here. In order to use floppy disk, your computer must have a floppy disk drive. (many do not).



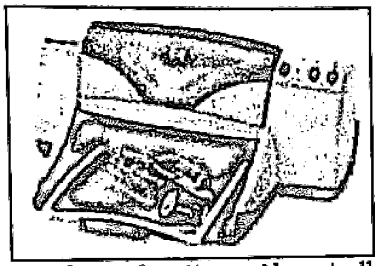


Zip Disks: Similar to floppy disk, but holding more and more reliable are Zip disks. However, computers must have a zip disk drive to be able to use zip disk.

PRINTERS TYPES

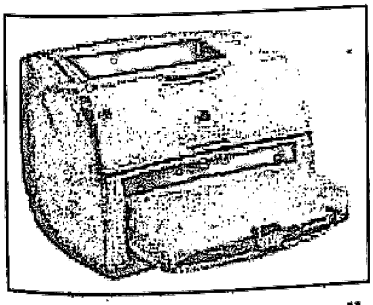
The main categories are : laser printers, ink-jets, dot-matrix, multifunctional, etc. Normally home computer users will use ink-jets as they are relatively cheap but superior in quality to dot-matrix. Laser jets and other printers created by new technology are more expensive and more commonly found in the offices.

INK-JETS



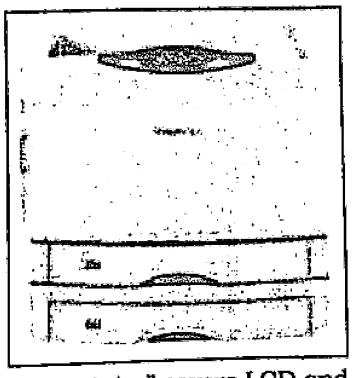
Ink-jets (bubble-jets) printers spray ionized tiny drops of ink onto a page to create an image. This is achieved by using magnetized plates which direct the ink's path onto the paper in the desired pattern. Almost all ink-jets offer a colour option as standard, in varying degrees of resolution. Ink-jet printers are capable of producing high quality print which almost matches the quality of a laser printer. A standard ink-jet printer has a resolution of 300 dots per inch, although newer models have improved on that. As a rule colour link-jet printers can also be used as a regular black and white printer.

LASER PRINTERS



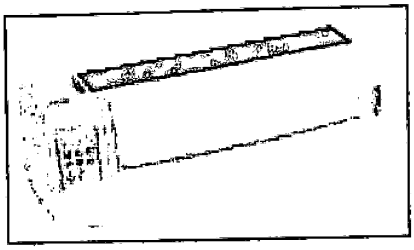
Laser printers operate by shining a laser beam to produce an image on a drum. The drum is then rolled through a pool, or reservoir, or toner, and the electrically charged portions of the drum pick up ink. Finally, using a combination of heat and pressure, the ink on the drum is transferred onto the page. Laser printers print very fast, and the supply cartridges work a long time. Colour laser printers use the same toner-based printing process as black and white (B/W) laser printers, except that they combine four different toner colours. Colour laser printers can also be used as a regular black and white laser printer.

LED/LCD PRINTERS



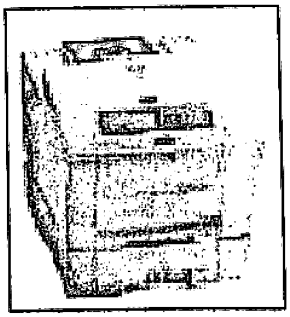
LED/LCD printers are types of electro photographic printers that are identical to laser printers in most ways. Both LCD (Liquid Crystal Display) and LED (Light-Emitting Diode) printers use a light source instead of a laser to create an image on a drum. In most contexts, "laser printer" covers LCD and LED printers as well. The print process is almost identical, but LED printers use Light Emitting Diodes to charge the drum, and the other uses Liquid Crystals. These printers produce a very high quality text and graphics print out.

IMPACT (DOT-MATRIX) PRINTERS



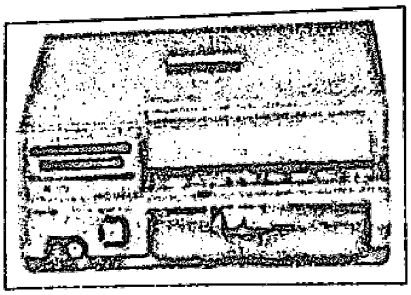
Impact (Dot-matrix) printers use a set of closely spaced pins and a ribbon to print letters or other characters on a page. These printers actually impact the page to print a character, much like a typewriter. Dot-matrix printers vary in terms of speed and the number of pins they have. They can run at a speed anywhere between 50 and 500 CPS (Characters Per Second). The number of pins, which can vary between 9 to 24, determines the quality of the print job. Dot matrix printers are commonly used for printing invoices, purchase orders, shipping forms, labels, and other multi-part forms. Dot matrix printers can print through multi-part forms in a single pass, allowing them to produce more pages than even high-speed laser printers.

SOLID INK PRINTERS



Solid Ink printers are page printers that use solid wax ink sticks in a "phase-change" process. They work by liquefying wax ink sticks into reservoirs, and then squirting the ink onto a transfer drum, from where it is cold-fused onto the paper in a single pass. Solid-ink printers offer better color consistency than do most technologies, with little variation caused by changes in temperature, humidity, or type of paper. Solid ink machines have better reliability, because they have fewer components in comparison, for example with color laser printers .

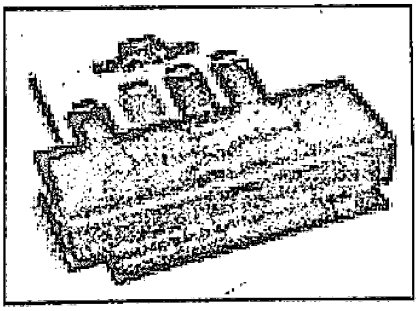
DYE SUBLIMATION PRINTERS



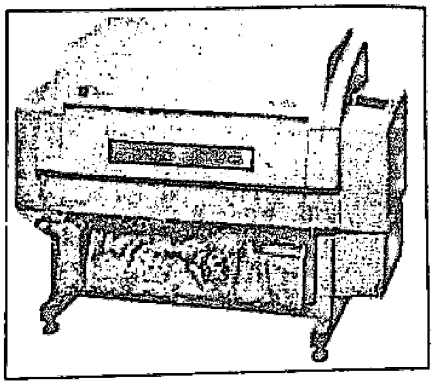
Dye Sublimation printers are professional devices widely used in demanding graphic arts and photographic applications. These printers work by heating the ink so that it turns from a solid into a gas. The heating element can be set to different temperatures, thus controlling the amount of ink laid down in one spot. In practice, this means that colour is applied as a continuous tone, rather than in dots, as with an inkjet. One colour is laid over the whole of one sheet at a time, starting with yellow and ending with black. The ink is on large rolls of film which contain sheets of each colour, so for an A4 print it will have an A4-size sheet of yellow, followed by a sheet of cyan, and so on. Dye sublimation requires particularly expensive special paper, as the dyes are designed to diffuse into the paper surface, mixing to create precise colour shades.

PORTABLE PRINTERS

Portable printers are usually fairly lightweight and sometimes carry the option of using a battery instead of drawing power from the computer. Usually they realize basic print resolutions suitable for plain text printing. In the market the following types of the portable printers are available : Thermal printer, Thermal transfer printer and Ink-Jet printer. The main advantage of thermal and thermal transfer printers is that they can be very small. The smallest thermal and thermal transfer printers weigh approximately one pound. Usually the ink-jet portable printer weighs more than 2 pounds. Thermal printers require a special type of paper



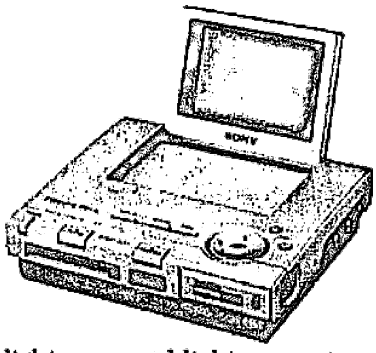
PLOTTERS



Plotters are large-scale printers that are very accurate at reproducing line drawings. They are commonly used for technical drawings such as engineering drawings or architectural blueprints. The two basic types of plotters are called flatbed plotters and drum plotters. Flatbed plotters are horizontally aligned with a flat surface to which a piece of paper is attached. The paper remains stationary and the printer moves pens across the paper to draw the image. Drum plotters, also called upright plotters, are vertically positioned. They have a drum that the paper rolls on. Drum plotters usually make more noise and are more compact than flatbed plotters.

DIGITAL PHOTO PRINTERS

Many middle range printers are now able to print photo quality images. Usually an option with color printers, specialist photo print heads allow a greater resolution to be achieved to improve photo image quality. Photo ink jet printers expand their gamuts by adding additional ink colors, usually light cyan and light magenta.

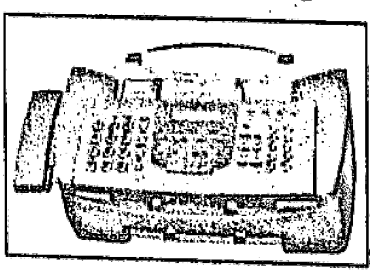


NETWORK PRINTER

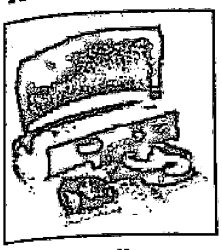
Network printer is a printer that provides output capabilities to all network users.

MULTIFUNCTION PRINTERS

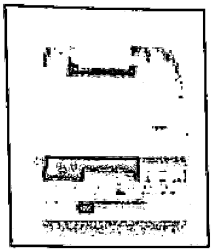
Multifunction printers combine top-quality color ink-jet or laser printing with plain-paper and PC faxing, color copying and color scanning , telephoning- all in one convenient, space-saving machine. If you work from home or have a small office a multifunctional device may be ideal.



THE BRAVO AUTOPRINTER



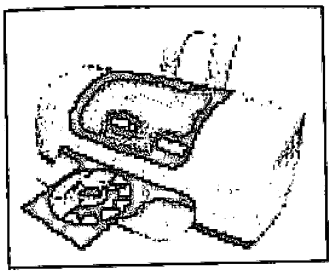
The Bravo AutoPrinter is the worlds first automated CD/DVD printing system that can truly be called innovative. It combines automatic, robotic-based CD or DVD printing along with full-color, 2400 dpi disc printing all in one compact, desktop unit.



PRINTERS FOR BANKING

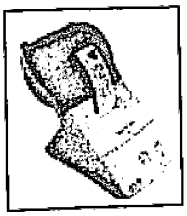
Printers for banking these printers realize innovative technology and functionality to increase productivity, and reduce costs.

EZ CD/DVD PRINTERS



EZ CD/DVD Printers provide a low cost way to create professional printed CD-Rs and DVD-Rs. Instead of writing on the CD or applying labels, you can print directly on the CD surface! With high speed capabilities, a full colour image can be printed directly on the top surface of your CDs in less than 1 minute.

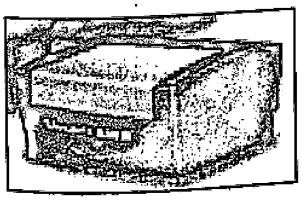
LABEL PRINTERS



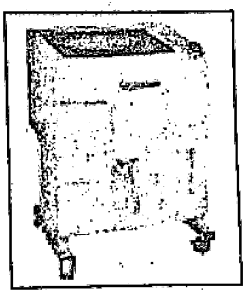
Label Printers are the smartest way to print labels one at a time. The printers allow easy installation. You can get high-quality, professional results every time.

VERSALASER

VersaLaser (Universal Laser Systems Inc.) is peripheral tool, that can transform images or drawings on your computer screen into real items made out of an amazing variety of materials... wood, plastic, fabric, paper, glass, leather, stone, ceramic, rubber... and it's as easy to use as your printer. 2 models of VersaLaser have 16"x12"(VL-200) and 24"x12" (VL-300) work areas.



3D PRINTERS



3D Printers (Z corporation). The ZPrinter 310 System creates physical models directly from computer-aided design system ("CAD") and other digital data in hours instead of days. The printer is fast, versatile and simple, allowing engineers to produce a range of concept models and functional test parts quickly and inexpensively. The system is ideal for an office environment or educational institution, providing product developers easy access to a 3D Printer.

DATA SCANNING DEVICES

OPTICAL RECOGNITION SYSTEMS

Optical recognition systems provide another means of minimizing keyed input by capturing data at the source. These systems enable the computer to "read" data by scanning printed text for recognizable patterns.

The banking industry developed one of the earliest scanning systems in the 1950's for processing cheques. **The Magnetic Ink Character Recognition (MICR) system is still used throughout the banking industry.** The bank, branch, account number and cheque number are encoded on the cheque before it is sent to the customer. After the customer has used the cheque and it comes back to the bank, all that needs to be entered manually is the amount. MICR has not been adopted by other industries because the character set has only fourteen symbols.

BAR CODE READERS

Of all the scanning devices, you are probably most familiar with BAR CODE READERS. Many retail and grocery stores use some form of bar code reader to determine the item being sold and to retrieve the item price from a computer system. The code reader may be a handled unit or it may be embedded in a countertop. The bar code reader reads the Universal Product Code (UPC), a pattern of bars printed on merchandise. The UPC has gained wide acceptance since its introduction in the 1970's. Initially, workers resisted the use of the code because the system was used to check their accuracy and speed. Today, bar codes are used to update inventory and ensure correct pricing. Federal Express uses a unique bar code to identify and track each package. Federal Express employees can usually tell a customer within a matter of minutes the location of any package.

OPTICAL MARK READERS

By taking exams, you are familiar with Mark Sense Character Recognition systems. Every time you take a test with a "fill in the bubble" Scantron form and use a #2 lead pencil, you are creating input suitable

for an **OPTICAL MARK READER (OMR)**. A #2 lead pencil works best because of the number of magnetic particles in that weight lead. The OMR senses the magnetized marks, enabling the reader to determine which responses are marked. OMR is very helpful to researchers who need to tabulate responses to large surveys. Almost any type of survey or questionnaire can be designed to be suitable for OMR devices. An OMR unit can be attached to a microcomputer and the data transferred to a file directly.

OPTICAL SCANNERS

OPTICAL SCANNERS can scan typed documents, pictures, graphics or even handwriting into a computer. Photographs scanned into a microcomputer appear clearly on the screen and can be displayed whenever desired. The copy that the computer stores never yellows with age. Early scanners could recognize only text printed in a special **OPTICAL CHARACTER RECOGNITION (OCR)** typeface. A scanner converts the image that it sees into numeric digits before storing it in the computer. This conversion process is known as DIGITIZING.

Depending on the volume and type of material to be scanned, you can use drum scanner, flatbed scanner, sheeted scanner and even small handheld scanners.

The small, handheld scanners are used most frequently with microcomputers; however, only 5 per cent of all microcomputer systems are equipped with scanners. Manufacturers responded to user reluctance to use scanners by releasing in 1995 a number of new, small paper scanners. (In 1994, full-page scanners). Most of these new devices sit between the keyboard and the monitor and can interface with a fax machine, send e-mail, and store documents on disk for archive purposes.

VOICE RECOGNITION DEVICES

Voice input and control systems have the potential of revolutionizing the way we communicate with computers. Steady progress has been made in this area, although there are still some problems.

Computer scientists and linguists have been working on VOICE RECOGNITION SYSTEMS for two decades. The major difficulty has been that people speak with different accents and intonations. For this reason, most successful voice recognition systems require a period of "training" for the system to get accustomed to an individual's accent and intonation.

DOCKING STATION

A platform into which you can install a portable computer. The docking station typically contains slots for expansion cards, bays for storage devices, and connectors for peripheral devices, such as printers and monitors. Once inserted in a docking station, the portable computer essentially becomes desktop model computer. When it is taken out, it becomes a portable computer again. Most importantly, the same data is accessible in both modes because it resides on the portable computer's drives. The idea behind docking stations is to let you simultaneously enjoy the expansion possibilities of desktop model computers with the portability of notebook computers. In addition, the docking station enables you to use a full-size keyboard and monitor when you're not travelling

OBJECTIVE QUESTIONS

1. Computers gather data, which means that they allow users to _____ data.
   (1) present (2) input
   (3) output (4) store
   (5) None of these
2. After a picture has been taken with a digital camera and processed appropriately, the actual print of the picture is considered:
   (1) dat(1), (2) output
   (3) input. (4) the process.
   (5) None of these
3. _____ is any part of the computer that you can physically touch.
   (1) Hardware (2) A device
   (3) A peripheral
   (4) An application
   (5) None of these
4. The components that process data are located in the:
   (1) input devices.
   (2) output devices.
   (3) system unit
   (4) storage component.
   (5) None of these
5. All of the following are examples of input devices EXCEPT a:
   (1) scanner. (2) mouse
   (3) keyboard (4) printer
   (5) None of these
6. Which of the following is an example of an input device?
   (1) scanner (2) speaker
   (3) CD
   (4) printer
   (5) None of these
7. All of the following are examples of storage devices EXCEPT:
   (1) hard disk drives.
   (2) printers
   (3) floppy disk drives.
   (4) CD drives.
   (5) None of these
8. The _____, also called the "brains" of the computer, is responsible for processing data
   (1) motherboard
   (2) memory
   (3) RAM
   (4) central processing unit (CPU)
   (5) None of these
9. The CPU and memory are located on the:
   (1) expansion board
   (2) motherboard
   (3) storage device.
   (4) output device.
   (5) None of these

10. _____ are specially designed computer chips that reside inside other devices, such as your car or your electronic thermostat.
(1) Servers
(2) Embedded computers
(3) Robotic computers
(4) Mainframes
(5) None of these

11. Which of the following devices can be processed to directly image printed text?
(1) OCR (2) OMR
(3) MICR (4) All of above
(5) None of these

12. The output quality of a printer is measured by
(1) Dot per inch
(2) Dot per sq. inch
(3) Dots printed per unit time
(4) All of above
(5) None of these

13. An error in software or hardware is called a bug. What is the alternative computer jargon for it?
(1) Leech (2) Squid
(3) Slug (4) Glitch
(5) None of these

14. _____ was the first output decice to print graphics and large engineering drawings.
(1) Plotter
(2) Laser Printer
(3) Inkjet Printer
(4) Impact Printer
(5) None of these

15. Personal computers use a number of chips mounted on a main circuit board. What is the common name for such boards?
(1) Daughter board
(2) Motherboard
(3) Father board
(4) Breadboard
(5) None of these

16. The system unit of a personal computer typically contains all of the following except:
(1) Microprocessor
(2) Disk controller
(3) Serial interface
(4) Modem
(5) None of these

17. The ALU of a computer responds to the commands coming from
(1) Primary memory
(2) Control section
(3) External memory
(4) Cache memory
(5) None of these

18. What is the latest write-once optical storage media?
(1) Digital paper
(2) Magneto-optical disk
(3) WORM disk
(4) CD-ROM disk
(5) None of these

19. Before a disk drive can access any sector record, a computer program has to provide the record's disk address. What information does this address specify?
(1) Track number
(2) Sector number
(3) Surface number
(4) All of the above
(5) None of these

20. As compared to diskettes, the hard disks are
(1) More expensive
(2) More portable
(3) Less rigid
(4) Slowly accessed
(5) None of these

21. Floppy disks which are made from flexible plastic material are also called?
(1) Hard disks
(2) High-density disks
(3) Diskettes
(4) Templates
(5) None of these

22. Regarding a VDU, Which statement is more correct?
(1) It is an output device
(2) It is an input device
(3) It is a peripheral device
(4) It is hardware item
(5) None of these

23. What is the name of the computer terminal which gives paper printout?
(1) Display screen
(2) Soft copy terminal
(3) Hard copy terminal
(4) Plotter
(5) None of these

24. A kind of serial dot-matrix printer that forms characters with magnetically-charged ink sprayed dots is called
(1) Laser printer
(2) Ink-jet printer
(3) Drum printer
(4) Chan printer
(5) None of these

25. Which printer is very commonly used for desktop publishing?
(1) Laser printer
(2) Inkjet printer
(3) Daisywheel printer
(4) Dot matrix printer
(5) None of these

26. An output device that uses words or messages recorded on a magnetic medium to produce audio response is
(1) Magnetic tape
(2) Voice response unit
(3) Voice recognition unit
(3) Voice band
(5) None of these

27. perforated paper used as input of output media is known as
(1) paper tapes
(2) magnetic tape
(3) punched papers tape
(4) card punch
(5) None of these

28. A/n .....Device is any device that provides information, which is sent to the CPU
(1) Input (2) Output
(3) CPU (4) Memory
(5) None of these

29. Current SIMMs have either .....or.....connectors (pins)
(1) 9 or 32 (2) 30 or 70
(3) 28 or 72 (4) 30 or 72
(5) None of these

30. Which of the following is not an input device ?
(1) VDU (2) Speakers
(3) Keyboard (4) (1) and (2)
(5) None of these

31. Which is considered a direct entry input device?
(1) Optical scanner
(2) Mouse and digitizer
(3) Light pen
(4) All of the above
(5) None of these

32. Which is used for manufacturing chips?
(1) Bus (2) Control unit
(3) Semiconductors
(4) A and b only
(5) None of these

33. Which of the following printers are you sure will not to use if your objective is to print on multi carbon forms?
(1) Daisy wheel
(2) Dot matrix
(3) Laser
(4) Thimble
(5) None of these

34. Which of the following printing devices an output composed of a series of data?
(1) Wire matrix printer
(2) Band printer
(3) Wang image printer
(4) Both 1 and 3
(5) None of these

35. Magnetic tape can serve as
(1) Secondary storage media
(2) Output media
(3) Input media
(4) All of the above
(5) None of these

36. What is the responsibility of the logical unit in the CPU of a computer?
(1) To produce result
(2) To compare numbers
(3) To control flow of information
(4) To do math's works
(5) None of these

37. The secondary storage devices can only store data but they cannot perform
(1) Arithmetic Operation
(2) Logic operation
(3) Fetch operations
(4) Either of the above
(5) None of these

38. Which of the printers used in conjunction with computers uses dry ink powder?
(1) Daisy wheel printer
(2) Line printer
(3) Laser printer
(4) Thermal printer
(5) None of these

39. Which of the following produces the best quality graphics reproduction?
(1) Laser printer
(2) Ink jet printer
(3) Plotter
(4) Dot matrix printer
(5) None of these

40. Which most popular input device is used today for interactive processing and for the one line entry of data for batch processing?
(1) Mouse
(2) Magnetic disk
(3) Visual display terminal
(4) Card punch
(5) None of these

41. User programmable terminals that combine VDT hardware with built-in microprocessor is
(1) Kips (2) PC
(3) Mainframe
(4) Intelligent terminals
(5) None of these

42. The storage capacity of a disk system depends on the bits per inch of track and the tracks per inch of
(1) Cylinder (2) Hum
(3) Cluster (4) Surface
(5) None of these

43. The disk drive component used to position read/write heads over a specific track I known as
(1) Acoustic couples
(2) Access arm
(3) Cluster
(4) All of the above
(5) None of these

44. An online backing storage system capable of storing larger quantities of data is
(1) CPU
(2) Memory
(3) Mass storage
(4) Secondary storage
(5) None of these

45. Which is an item of storage medium in the form of circular plate?
(1) Disk (2) CPU
(3) Printer (4) ALU
(5) None of these

46. Another word for a daisy wheel printer
(1) Petal printer
(2) Golf ball printer
(3) Laser printer
(4) Line printer
(5) None of these

47. An input /output device at which data enters or leaves a computer system is
(1) Keyboard
(2) Terminal
(3) Printer
(4) Plotter
(5) None of these

48. A group of magnetic tapes, videos or terminals usually under the control of one master is
(1) Cylinder (2) Surface
(3) Track (4) Cluster
(5) None of these

49. The brain of any computer system is
(1) ALU
(2) Memory
(3) CPU
(4) Control unit
(5) None of these

50. Which of the items below are considered removable storage media?
(1) Removable hard disk cartridges
(2) (Magneto-optical) disk
(3) Flexible disks cartridges
(4) All of the above
(5) None of these

51. Which of the following are (is) considered to be video component?
(1) Resolution
(2) Color depth
(3) Refresh rate
(4) All of the above
(5) None of these

52. Which of the following items are examples of storage devices?
(1) Floppy / hard disks
(2) CD-ROMs
(3) Tape devices
(4) All of the above
(5) None of these

53. Before a disk can be used to store data. It must be.....
(1) Formatted
(2) Reformatted
(3) Addressed
(4) None of the above
(5) None of these

54. A high quality CAD system uses the following for printing drawing and graphs
(1) Dot matrix printer
(2) Digital plotter
(3) Line printer
(4) All of the above
(5) None of these

55. What are the three decisions making operations performed by the ALU of a computer?
(1) Grater than
(2) Less than
(3) Equal to
(4) All of the above
(5) None of these

56. Which part of the computer is used for calculating and comparing?
(1) Disk unit (2) Control unit
(3) ALU (4) Modem
(5) None of these

57. Which one of the following input device is user-programmable?
(1) Dumb terminal
(2) Smart terminal
(3) VDT
(4) Intelligent terminal
(5) None of these

58. Plotter accuracy is measured in terms of repeatability and
(1) Buffer size
(2) Resolution
(3) Vertical dimensions
(4) Intelligence
(5) None of these

59. The number of records contained within a block of data on magnetic tape is defined by the
(1) Block definition
(2) Record contain clause
(3) Blocking factor
(4) Record per block factor
(5) None of these

60. Which of the following memory medium is not used as main memory system?
(1) Magnetic core
(2) Semiconductor
(3) Magnetic tape
(4) Both 1 and 2
(5) None of these

61. One of the main feature that distinguish microprocessors from micro-computers is
(1) Words are usually larger in microprocessors
(2) Words are shorter in microprocessors
(3) Microprocessor does not contain I/O devices
(4) Exactly the same as the machine cycle time
(5) None of these

62. An integrated circuit is
(1) A complicated circuit
(2) An integrating device
(3) Much costlier than a single transistor
(4) Fabricated on a tiny silicon chip
(5) None of these

63. Most important advantage of an IC is its
(1) Easy replacement in case of circuit failure
(2) Extremely high reliability
(3) Reduced cost
(4) Low powers consumption
(5) None of these

64. Which of the following are the two main components of the CPU?
(1) Control Unit and Registers
(2) Registers and Main Memory
(3) Control unit and ALU
(4) ALU and bus
(5) None of these

65. Different components n the motherboard of a PC unit are linked together by sets of parallel electrical conducting lines. What are these lines called?
(1) Conductors
(2) Buses
(3) Connectors
(4) Consecutives
(5) None of these

66. Magnetic disks are the most popular medium for
(1) Direct access
(2) Sequential access
(3) 1 & 2
(4) All of the above
(5) None of these

67. Reading data is performed in magnetic disk by
(1) Read/write leads
(2) Sectors (3) Track
(4) Lower surface
(5) None of these

68. Hard disk is coated in both side above
(1) Magnetic metallic oxide
(2) Optical metallic oxide
(3) Carbon layer
(4) All of the above
(5) None of these

69. Binary circuit elements have
(1) One stable state
(2) Two stable state
(3) Three stable state
(4) All of the above
(5) None of these

70. Microprocessors can be used to make
(1) Computers
(2) Digital systems
(3) Calculators
(4) All of above
(5) None of these

71. A characteristic of card systems is:
(1) Slowness in processing data
(2) Using cards as records of transactions
(3) Needing a larger DP staff
(4) All of the above
(5) None of these

72. The speed of minicomputer is
(1) 1 (MIPS) (2) 2 (MIPS)
(3) 100 (MIPS)
(4) 1000 (MIPS)
(5) None of these

73. Which of the following is NOT a hardware of a computer ?
(1) Monitor (2) Key Board
(3) Windows
(4) Central Processing Unit
(5) Mouse

Bank of Baroda Clerk Exam, 30.11.2008

74. Most of the commonly available personal computers/ laptops have a keyboard popularly known as—
(1) QWERTY (2) QOLTY
(3) ALTER (4) UCLIF
(5) None of these
Bank of Baroda Clerk Exam, 30.11.2008

75. A hard copy of a file created on a computer refers to data
(1) saved on a floppy disk
(2) printed on a printer
(3) backed up on a tape drive
(4) sent as an e-mail
(5) None of these
SBI PO Tier-I Exam, 13.10.2008

76. When you quickly press and release the left mouse button twice, you are ____.
(1) Primary – clicking
(2) Pointing
(3) Double – clicking
(4) Secondary – clicking
(5) None of these
Allahabad Bank Clerk Exam, 31.08.2008

77. ____ processes data which is also called brain of the computer.
(1) Motherboard
(2) Memory (3) RAM
(4) Central Processing Unit (CPU)
(5) None of these
Allahabad Bank Clerk Exam, 31.08.2008

78. A series 100 POST error code indicates a problem with the :
(1) hard drive (2) ram or rom
(3) system board
(4) video adapter
(5) None of these
Allahabad Bank Clerk Exam, 31.08.2008

79. The time it takes a device to locate data and instructions and make them available to the CPU is known as ____.
(1) clock speed
(2) a processing cycle
(3) CPU speed
(4) access time
(5) None of these
SBI PO Tier-I Exam, 27.07.2008

80. _____ is when the more power hungry components, such as the monitor and hard drive, are put in idle:
(1) Hibernation
(2) Power down
(3) Standby mode
(4) The shutdown procedure
(5) None of these
SBI Clerk Exam, First Sitting, 13.07.2007

81. Hard disk drives are considered _____ storage .
(1) Flash
(2) Nonvolatile
(3) Temporary
(4) Nonpermanent
(5) None of these

82. The most common input devices are the ____ and the ____.
(1) microphone , printer
(2) scanner, monitor
(3) digital camera, speakers
(4) keyboard, mouse
(5) None of these

83. What are the two types of output devices?
(1) Monitor and printer
(2) Storage disk (floopy, CD)
(3) Keyboard and Mouse
(4) Windows 2000, Windows NT
(5) None of these
SBI Clerk Exam, Second Sitting, 13.07.2008

84. Every component of your computer is either —
(1) hardware or software
(2) software or CPU/RAM
(3) application software or system software
(4) input devices or output devices
(5) None of these

85. The _____ performs simple mathematics for the CPU.
(1) ALU (2) DIMM
(3) BUS (4) Register
(5) None of these

86. Reusable optical storage will typically have the acronym —
(1) CD (2) RW
(3) DVD (4) ROM
(5) None of these

87. You can use the tab key to
(1) move a cursor across the screen
(2) indent a paragraph
(3) move the cursor down the screen
(4) Only (1) and (2)
(5) None of these
SBI PO Tier-I Exam, 27.07.2008

88. The best reason that a computer needs to have a hard disk is because
(1) it can then use the same programs as other computers
(2) it would not work without one
(3) it can store information when it is switched off
(4) it can store information while it is working
(5) None of these

89. What is name of the logic circuit which can add two binary digits
(1) half adder (2) full adder
(3) parallel adder
(4) serial adder
(5) None of these

90. The speed at which the monitor accepts data is called
(1) Bandwidth (2) Interlacing
(3) Response time
(4) Scanning
(5) Maximum speed

91. Data going into the compurter is called
(1) output (2) algorithm
(3) input
(4) calculations
(5) flowchart
SBI Clerk Exam, 06.01.2008

92. Transformation of input into output is performed by
(1) Peripherals
(2) Memory (3) Storage
(4) The Input-Output unit
(5) The CPU

93. A_____ ,is an electronic device that process data, converting it into information.
(1) Processor (2) Computer
(3) Case (4) Stylus
(5) None of these
SBI Clerk Exam, Second Sitting, 13.07.2008

94. Codes consisting of bars or lines of varying widths or lengths that are computer-readable are known as—
(1) an ASCII code
(2) a magnetic tape
(3) an OCR scanner
(4) a bar code
(5) None of these
Bank of Baroda Clerk Exam, 30.11.2008

95. When you quickly press and release the left mouse button twice, you are ____.
(1) Primary – clicking
(2) Pointing
(3) Double – clicking
(4) Secondary – clicking
(5) None of these
Allahabad Bank Clerk Exam, 31.08.2008

96. The _____ key and the _____ key can be used in the combination with other keys to perform shortcuts and special tasks.
(1) Control, Alt
(2) Function, toggle
(3) Delete, insert
(4) Caps Lock, Num Lock
(5) None of these

97. What is the full form of USB as used in computer related activities ?
(1) Universal Security Block
(2) Ultra Serial Block
(3) United Service Block
(4) Universal Serial Bus
(5) None of these
Bank of Baroda Clerk Exam, 30.11.2008

98. To make a notebook act as a desktop model, the notebook can be connected to a _____ which is connected to a monitor and other devices.
(1) bay
(2) docking station
(3) port
(4) network
(5) None of these
SBI Clerk Exam, 06.07.2008

99. _____ Keyboards are more compact and generally have fewer keys.
(1) Laptop (2) Windows
(3) Macintosh (4) QWERTY
(5) None of these

100. A _____ allows you to capture sound waves and transfer them to digital format on your computer.
(1) speaker
(2) microphone
(3) keyboard (4) stylus
(5) None of these

101. _____ Printers have tiny hammer-like keys that strike the paper through an inked ribbon.
(1) Inkjet (2) Impact
(3) Nonimpact
(4) Laser Moderate
(5) None of these

102. Inkjet printers and laser printers are examples of _____ printers.
(1) nonimpact
(2) impact
(3) dot-matrix
(4) thermal
(5) None of these

103. _____ are large printers used to produce oversize pictures that require precise continuous lines, such as maps and architectural plans.
(1) Dot-matrix printers
(2) Thermal printers
(3) Multifunction printers
(4) Plotters
(5) None of these

ANSWERS

1. (2)	**2.** (2)	**3.** (1)	**4.** (3)
5. (4)	**6.** (1)	**7.** (2)	**8.** (4)
9. (2)	**10.** (2)	**11.** (1)	**12.** (1)
13. (4)	**14.** (1)	**15.** (2)	**16.** (4)
17. (2)	**18.** (4)	**19.** (4)	**20.** (3)
21. (3)	**22.** (3)	**23.** (3)	**24.** (2)
25. (1)	**26.** (2)	**27.** (1)	**28.** (1)
29. (4)	**30.** (4)	**31.** (4)	**32.** (3)
33. (3)	**34.** (4)	**35.** (4)	**36.** (2)
37. (4)	**38.** (3)	**39.** (3)	**40.** (1)
41. (4)	**42.** (4)	**43.** (2)	**44.** (3)
45. (1)	**46.** (2)	**47.** (2)	**48.** (4)
49. (3)	**50.** (4)	**51.** (4)	**52.** (4)
53. (1)	**54.** (2)	**55.** (4)	**56.** (3)
57. (4)	**58.** (2)	**59.** (3)	**60.** (3)
61. (3)	**62.** (4)	**63.** (2)	**64.** (3)
65. (2)	**66.** (3)	**67.** (1)	**68.** (1)
69. (2)	**70.** (4)	**71.** (4)	**72.** (1)
73. (3)	**74.** (1)	**75.** (2)	**76.** (3)
77. (4)	**78.** (3)	**79.** (2)	**80.** (1)
81. (2)	**82.** (4)	**83.** (1)	**84.** (4)
85. (1)	**86.** (2)	**87.** (4)	**88.** (2)
89. (1)	**90.** (1)	**91.** (3)	**92.** (5)
93. (2)	**94.** (4)	**95.** (3)	**96.** (1)
97. (4)	**98.** (2)	**99.** (1)	**100.** (2)
101. (2)	**102.** (1)	**103.** (4)	

EXPLANATIONS

1. (2) Input: All computers, no matter what their size, must gather data before they can process the data. The operational program will dictate how the data is gathered—manually, automatically, or a combination of both. Manually, an operator or technician will input the data to the computer by input devices like mouse, keyboard.

2. (2) Print of a picture is output from the printer of a picture taken by digital camera.

3. (2) Hardware Refers to objects that you can actually touch, like disks, disk drives, display screens, keyboards, printers, boards, and chips. In contrast, software is untouchable. Software exists as ideas, concepts, and symbols, but it has no substance.

9. (2)In personal computers a motherboard is the central printed circuit board (PCB) in many modern computers and holds many of the crucial components of the system, while providing connectors for other peripherals. A typical desktop computer has its microprocessor, main memory, and other essential components connected to the motherboard.

10. (2) Embedded computers are computers that are a part of a machine or device. Embedded

computers generally execute a program that is stored in non-volatile memory and is only intended to operate a specific machine or device.

11. (1) Optical character recognition usually abbreviated as OCR, represents the electronic translation of images containing handwritten, typewritten or printed text (usually captured by a scanner) into computer editable text.

12. (1) DPI is abbreviation of dots per inch, which indicates the resolution of images. The more dots per inch, higher the resolution. A common resolution for laser printers is 600 dots per inch. This means 600 dots across and 600 dots down, so there are 360,000 dots per square inch.

13. (4) A computer glitch is the failure of a system, usually containing a computing device, to complete its functions or to perform them properly. In public declarations, glitch is used to suggest a minor fault which will soon be rectified and is therefore a euphemism by comparison to bug, which is a factual statement that a programming fault is to blame for a system failure.

16. (4) Modem is required to access the internet. It is not a common part of computer. a serial port or interface is a serial communication physical interface through which information transfers in or out one bit at a time between system part and devices.

17. (2) Control section or control unit of CPU controls the entire operation of the computer and the CPU. The control Unit upon receiving an instruction decides what is to be done with it. That is, whether it is to be sent the ALU for further processing or to the output devices or to memory etc.

27. (1) Punched tape or paper tape is a largely obsolete form of data storage, consisting of a long strip of paper in which holes are punched to store data. It was widely used during much of the twentieth century for teleprinter communication, and later as a storage medium for mini computers and CNC machine tools

29. (4) A SIMM, or single in-line memory module, is a type of memory module containing random access memory used in computers. Current SIMMs has 72 pins and provides 32 bits of data (36 bits in parity versions).

33. (3) To make multi carbon copy, a impact is required to punch copy. Daisy wheel, dot matrix and thimble printer is impact type to print. While laser user a laser beam for printing which not make any carbon copy.

41. (4) A termina (monitor and keyboard) that contains processing power. Intelligent terminals include memory and a processor to perform special display operations.

47. (2) A computer terminal is an electronic hardware device that is used for entering data into, and displaying data from, a computer or a computing system.

59. (3) blocking factor is the number of records, words, characters, or bits in a block.

60. (3) Main memory is the memory in the computer itself. It can be semiconductor RAM, magnetic core memory, or thin film memory.

65. (2) The buses are the means by which the CPU, memory, and I/O communicate with each other.

69. (2) Binary circuit has two stable state 0 or 1

78. (3) POST: power on self test, Power on Self Test is the initial set of diagnostic tests performed by the computer when powered on. Tests that fail are relayed to the user via the use of codes, beep or on-screen POST error messages immediately after the computer powers on. The POST is handled by the system's BIOS. POST diagnostic code descriptions used from 100 to 199 for system boards

80. (1) Hibernation is a feature of many computer operating systems where the contents of RAM are written to non-volatile storage such as a hard disk, as a file or on a separate partition, before powering off the computer. When the computer is restarted it reloads the content of memory and is restored to the state it was in when hibernation was invoked. Hibernation is used as an alternative to powering down the computer, because hibernating and later restarting is usually faster than closing down, later starting up, and starting all the programs that were running.
Systems also support a low-power sleep mode or standby mode in which the processing functions of the machine are powered down, using a little power to preserve the contents of RAM and support waking up; wakeup is almost instantaneous.

81. (2) Non-volatile memory, non-volatile memory, NVM or non-volatile storage, in the most basic sense, is computer memory that can retain the stored information even when not powered. Examples of non-volatile memory include most types of magnetic computer storage devices (e.g. hard disks, floppy disks, and magnetic tape), optical discs, and early computer storage methods such as paper tape and punched cards.

84. (1) A computer system has hardware and software. Hardware: input output devices, storage memory, CPU. Software: Operations system, application software.

86. (2) A CD-RW (Compact Disc-Rewritable) is a rewritable optical disc.

90. (1) In computer science, bandwidth is a bit rate measure of available or consumed data communication resources expressed in bits/second or multiples of it (kilobits/s, megabits/s)