Unit 1

Introduction to Computer and Internal/external parts used with computer cabinets

-14 Marks

Q-A Objective Type Questions (1 mark of each).

- 1. <u>Charles Babbage</u> is the father of computer.
- 2. <u>Data</u> is a raw material which should be 100% fact.
- 3. Mainframe, super computer, minicomputer, etc. can be classified into **Digital** computer.
- 4. Second generation computer used <u>Transistors</u> technology.
- 5. Art of simulating human/animal brain is known as **neural network**.
- 6. CPU stands for Central Processing Unit.
- 7. **<u>CU(control unit)</u>** is used for controlling the activities of computer.
- 8. Define Soft Copy: Output of monitor is known as soft copy.
- 9. **Primary storage device** is used for temporary storage.
- 10. ALU Stands for **Arithmetic Logic Unit.**
- 11. RAM Stands for Random Access Memory.
- 12. Rom Stands for Read Only Memory.
- 13. EEPROM Stands for Electrically Erasable Programming Read Only Memory.
- 14. USB Stands for Universal Serial Bus.
- 15. <u>Motherboard</u> is the main building block of computer which can be hold internal parts of computer.
- 16. <u>Parallel Port</u> is used less these days and are replaced by USB ports.
- 17. Any motherboard can support all type of Ram chips? False
- 18. Core i7 will be your choice when you want to buy computer.
- 19. ISA Stands For Industry Standard Architecture.
- 20. PCI Stands For **Peripheral Component Interface.**

Q-B Attempt the Questions (2 mark of each).

1. What is motherboard?

- ➤ Computer motherboard is nothing but the circuit board for the circuit which controls the entire function of the computer all the components that make up your computer are connected to the motherboard.
- 2. Explain analogue and digital computers.

- ➤ Analogue computer: In an analogue computers data is represented is continuously varying voltage operator essentially by measuring rather counting If the data is continuously variable the results obtained are estimated and not exactly repeatable voltage temperature and pressure measured using analogue device like voltmeter thermometer and barometer.
- ➤ **Digital computer:** in digital computers data is repeated units of electrical pulse data is measured in quantities represented is either on or off state therefore the result of 10 from a digital computer are measurable and resize Virtually all of today's computer and based on digital computer.

3. Explain Graphics card.

➤ A Graphics card (also called a display card, video card, display adapter, or graphics adapter) is an expansion card which generates a feed of output images to a display device (such as a computer monitor). Frequently, these are advertised as discrete or dedicated graphics cards, emphasizing the distinction between these and integrated graphics. At the core of both is the graphics processing unit (GPU), which is the main part that does the actual computations, but should not be confused with the video card as a whole, although "GPU" is often used to refer to video cards.

4. Explain USB cable.

- ➤ it is the most popular standard for connecting various Peripheral device to computer using USB you can connect almost everything to your computer
- there are 3 version of USB
- > USB 1.0 /1.1
- ➤ USB 2.0
- ➤ USB 3.0

5. Explain sound card.

- A sound card (also known as an audio card) is an internal expansion card that provides input and output of audio signals to and from a computer under control of computer programs. The term sound card is also applied to external audio interfaces used for professional audio applications.
- Sound functionality can also be integrated onto the motherboard, using components similar to those found on plug-in cards. The integrated sound system is often still referred to as a *sound card*. Sound processing

- hardware is also present on modern video cards with HDMI to output sound along with the video using that connector; previously they used a S/PDIF connection to the motherboard or sound card.
- Typical uses of sound cards or sound card functionality include providing the audio component for multimedia applications such as music composition, editing video or audio, presentation, education and entertainment (games) and video projection. Sound cards are also used for computer-based communication such as voice over IP and teleconferencing.

6. Explain network card.

A network interface controller (NIC, also known as a network interface card, network adapter, LAN adapter or physical network interface and by similar terms) is a computer hardware component that connects a computer to a computer network. Early network interface controllers were commonly implemented on expansion cards that plugged into a computer bus. The low cost and ubiquity of the Ethernet standard means that most new computers have a network interface built into the motherboard. Modern network interface controllers offer advanced features such as interrupt and DMA interfaces to the host processors, support for multiple receive and transmit queues, partitioning into multiple logical interfaces, and on-controller network traffic processing such as the TCP offload engine.

7. Explain ISA slot and PCI slot.

ISA slot stands for industry standard architecture slot ISA are an older type of expansion slot twice as big as PCI slot and slower than PCI slot as well ISA slot are usually black while PCI slot are usually white ISA slot not used much anymore but most computer still have at least one of them.ISA slot are called multipurpose slots because they can be used for variety of cards PCI slot stands for peripheral component interface they are used as general purpose slot. the PCI slot is the main motherboard slot that is used to upgrade computers.

8. List out the example of micro computers.

- IBM-PC
- IBM-PC/XT
- IBM-PC/AT
- Desktops

9. List out the example of mini computers.

- Hewlett-Packard HP 3000 series, HP 2100 series, HP 1000 series.
- CDC 160A, CDC 1700

• DEC PDP, VAX Series

10.List out the example of Mainframe computers.

- IBM CICS
- System/360, system/370
- zSeries, IBM system Z10, IBM system z9

11.List out the example of super computers.

- Param Padma
- Cray, XK6, XE6, uRIKA
- MEENIAC, MINEIAC, and MOENIAC
- IBM blue gene

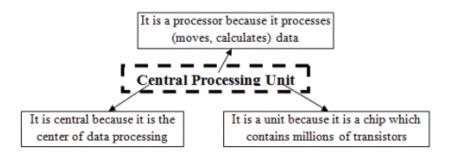
Q-C Attempt the Questions (3 mark of each).

1. Explain ports.

- ➤ serial port: serial ports send some information one bit at a time down a single wire you can look at it like a two way Street every car in a lane travels in a single line. serial port where basically developed devices that didn't required speed such as Mice and keyboard
- ➤ Parallel port : parallel port is the oldest type of port which is available in computer although most of modern motherboard have replaced parallel port with other type of Port like PS2 port or USB port
- ➤ **USB Port**: Universal serial bus port is a small rectangular port and is the primary way used today to attach all kind of device via USB cable device must have a USB connector to in order to connect to a USB port mice, keyboard, printer and digital cameras are only a few of the many device that can be USB
- ➤ PS/2 Port: the PS2 port simple 6-pin low speed serial connection commonly dedicated to a keyboard and mouse although this port may look identical at first glance there are not interchangeable so you will need to be extremely careful to attached the keyboard and mouse to their respective PS2 port you can easily identify keyboard ps2 port which is blue colour and mouse ps2 port which is green colour.

2. Central Processing Unit

Central Processing Unit (CPU) performs all the arithmetic and logical calculations in a computer. The CPU is said to be the brain of the computer system. It reads and executes the program instructions, perform calculations and makes decisions. The CPU is responsible for storing and retrieving information on disks and other media.



The CPU consists of Control Unit, Arithmetic and Logic Unit (ALU) and register set.

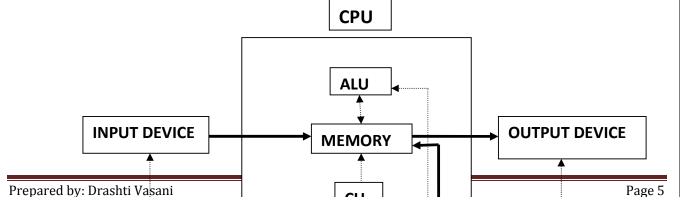
- ➤ **Control Unit:** The control unit issue control signals to perform specific operation and it directs the entire computer system to carry out stored program instructions
- Arithmetic and Logic Unit: The ALU is the 'core' of any processor. It executes all arithmetic operations (addition, subtraction, multiplication and division), logical operations (compare numbers, letters, special characters etc.) and comparison operators (equal to, less than, greater than etc.).
- ➤ **Register Set:** Register set is used to store immediate data during the execution of instruction. This area of processor consists of various registers.

3. Explain simple model of computer.

➤ We discussed that in order to use computer we need to input something which get process inside computer and finally the result is produced consider the following diagrams



- this is what have computer can work you need to input something which get processed inside CPU and after that you can have the desired output. output is produced as per processing
- ▶ let us go for a computer diagram as a bit broad view than the upper one which illustrate different important parts related to basic computer Technology it also help to understand how information flows within computer in which particular direction.





> you can see that in a block diagram two types of signals are drawn one which dotted line and another with thick line signal with dotted line shows how control unit is connected to different parts of computer where is thick line shows in which direction information flows

4. Explain dual core, Core 2 Duo, i3 processor.

- ➤ Intel dual core : dual core processor based on the core micro architecture a class beneath the Core 2 Duo and core duo of Intel processer offering the Pentium dual core available in current desktop and laptop.
- ➤ Core 2 Duo: contains two processing core to optimize gaming video and image processing laptops with this chip tend to be thinner and more energy efficient.
- ▶ i3 processer: derived from the same architecture is the higher and I5 and I7. The i3 is available strictly as a dual core processer though hyper threading available it does not feature Turbo boost the core I3 processer present higher level of performance than the core at a smaller cost.

5. Use of the computer.

- ➤ I think discussing about various use of computer is really a waste thing to discuss today's Technology world computer has taken its position almost everywhere it is used starting from a very small used to use of giant organizations which are spread among different countries.
- ➤ The biggest use is Internet where you can find any type of information.
- Education
- Personal use
- Banking sector
- Railway, air, bus reservation system
- weather forecasting
- Scientific computing and modeling
- Business computing
- online billing a online shopping system

- Automated customer care support
- Decision making and expert system
- Artificial intelligence
- > Entertainment
- Desktop publishing

6. Explain ROM and its type.

- ➤ ROM (read only memory) Integrated circuit program with specific data when it is manufactured ROM chips are used not only in computer but in most other electronic items. ROM Computer memory on which data has been pre produced once data has been written onto a ROM chip it cannot be removed and you only be read. There are different types of ROM available today
- ▶ PROM (Programmable read only memory): which means a type of ROM which can be reprogrammed creating ROM chip totally from scratch is time-consuming and very expensive in small quantities for this reason mainly developers created type of ROM known as Programmable read-only memory to change the value of cell to 0.you use a programmer to send a specific amount of current to the cell the higher voltage break the connection between column and row by burning out of fuse this process is known as burning the PROM
- ➤ **EPROM** (erasable Programmable read-only memory): you can not write the data to it A each step ahead PROM is Programmable ROM where initially it is generally blank you can program it once but programming it again is difficult task.
- ➤ **EEPROM** (electrically erasable Programmable read-only memory): they steel require dedicated equipment and a labor-intensive process to remove and reinstall them each time a change is necessary EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge.

7. Explain what input device is.

➤ Computer system is only useful if there are data to be proceed input device are peripheral that allow data to be captured and transmitted to the computer system data from outside the system is not only usually in a computer readable from and therefore input can be entered from a keyboard mouse pointing device USB stick and the various type of photo storage cards used by digital cameras older personal computers used floppy disks and Magnetic tape devices

All input Peripheral device perform the following function

- > Accept the data and instructions from the outside world
- > Convert it to a form that the computer can understand
- Supply that converted data to the computer system for further processing

8. Explain what output device is.

- computer would be of no use if the result after processing and not disseminated output device convert information from machine readable form to human readable form the most common device used in computer system is the monitor where information is displayed this form of output is known as of soft copy. And the form of output which are getting on the printer is known as hard copy
- Commonly used output unit are printers and visual display unit also known simply as a screen. LED LCD plasma type of output device
- ➤ All output Peripheral device perform the following functions
- ➤ Accept output data and instructions from the computer
- Convert it to that outside world can understand
- Supply that converted data to the outside world

9. Explain what storage device is.

➤ the main reason of using computer is it can store the data permanently without damaging the data even after plenty of years in computer the data domain as is it is even if you don't use it often human brain may forget something after several years

As a fact storage can be done in two places as follows:

- Primary storage
- secondary storage
 - secondary storage devices are also referred as secondary memory consists of device that allow more permanent storage of data secondary storage is used like an archive which means collection of some files or you can say a type of library.
 - ➤ Various type of storage devices are available today as hard disc, USB(pen drive), CD, DVD, blue ray disk. rarely used or previously used storage device are floppy disk, Magnetic tape.

10.Explain RAM and its type.

Random Access Memory is the best known form of Computer memory RAM is the example of volatile memory RAM is considered

Random Access because you can access any memory cell directly if you know the row and column that inserted at the cell .

- In general RAM can be categorized into two parts
 DRAM (Dynamic Random Access Memory)
 SRAM (Static Random Access Memory)
- ➤ **DRAM** (Dynamic Random Access Memory): it is a memory which continuously need power to be supplied in order to store the data within it dynamic Random Access Memory is a type of Random Access Memory that stores each bit of data in separate capacitor within an integrated circuit the main memory in personal computer is dynamic Ram it is the RAM in laptop and workstation computers as well as some of the video gaming console.
- > SRAM (Static Random Access Memory): SRAM is static it does not need continuously power in order to maintain the data it does not need periodic refresh static Random Access Memory uses multiple transistor typically 4 to 6.for each memory cell but doesn't have a capacitor in each cell it is used for primary cache.
- > SRAM cell has three different state

Standby

Reading

Writing

11.Limitations of the computer.

- ➤ After all computer is a machine and it definitely has some limitation which are not then as in human brain this does not mean that computers are not used
- Unlike human brain computer cannot think on its own it has to be given early detailed instructions and every step of its operation has to be described it can detect flow in login input
- ➤ The computer is either produce erroneous result simply given the task if situation of course that is outside the scope of the instruction specified to it.
- ➤ Humans have the potential to try out various alternatives to solve the unexpected problems which computers do not have.

Q-D Attempt the Questions (5 mark of each).

1) Explain characteristics of computer.

Some of the characteristic of computer are

- accuracy
- portable
- speed
- multitasking
- storage capacity
- no feelings
- versatility
- dumb terminal

Let us discuss each of these characteristic one by one

- ➤ Accuracy: the accuracy of computer is very high the degree of accuracy of particular computer depends upon its design error can occur by the computer but these are due to human weakness due to incorrect data but not due to the technological weakness
- ➤ **Speed:** computer is a very fast device it can perform the amount of work in few seconds for which human can take an entire year while talking about computer speed we do not talk in terms of seconds and milliseconds but in microseconds
- ➤ Storage capacity: computer can store and any amount of data because of a high storage capacity of its storage devices every piece of information can be retained as long as desired by the user and can be recalled as and when required even after several years if the information it will be as accurate as on the day when it field to the computers computer forgets or losses information only when it is asked to do
- ➤ Versatility: it is one of the most wonderful feature about the computer because at one moment it is preparing the results of a computer examination the next moment it is busy with preparing electricity bills in between it may be helping an office secretary to trace and important letter in second
- ➤ **Portable:** you all know that today computer are so compact in size even today we have tablet PCs which give functionally of full-fledged computer in short computers have become so portable but the functionality is not compromised
- ➤ Multitasking: in early days of computer it was able to do only one task at a time the processor itself was designed in a way that only one task can be done at a time today due to high speed different types of operating system it is quite possible to go for multitasking at the

- same time for example at the same time you can listen to a song print some data and also to lot more things together
- No feelings: a computer has no feelings because there machines please based on out feeling task knowledge and experience we often make certain judgement in our day to day life but computer course exactly the way which we have given the instructions.
- dumb terminal: computer is a not a magical device it cannot make a judgement of its on its judgement or feeling are based on the instructions given to it as program or that are written by bus only each and every instructions and process is specified to it according to that only it is performing so we can say that the computer are only good as man makes and uses them in a proper way.

2) Explain generations of computer in detail.

➤ The development of electronic computers can be divided into five generations depending upon the technologies used. The following are the five generations of computers.

> First Generation of Computers (1942-1955)

The beginning of commercial computer age is from UNIVAC (Universal Automatic Computer). It was developed by two scientist mauchly and Echert at the Census Department of United States in 1947. The first generation computers were used during 1942-1955. They were based on vacuum_tubes. Examples of first generation computers are ENIVAC and UNIVAC-1.

Advantages

- Vacuum tubes were the only electronic component available during those days.
- Vacuum tube technology made possible to make electronic digital computers.
- These computers could calculate data in millisecond.

Disadvantages

- The computers were very large in size.
- They consumed a large amount of energy.
- They heated very soon due to thousands of vacuum tubes.
- They were not very reliable.
- Air conditioning was required.

- Constant maintenance was required.
- Non-portable.
- Costly commercial production.
- Limited commercial use.
- Very slow speed.
- Limited programming capabilities.
- Used machine language only.
- Used magnetic drums which provide very less data storage.
- Used punch cards for input.
- Not versatile and very faulty.

Second Generation Of Computers (1955-1964)

The second generation computers used transistors. The scientists at Bell laboratories developed transistor in 1947. These scientists include John Barden, William Brattain and William Shockley. The size of the computers was decreased by replacing vacuum tubes with transistors. The examples of second generation computers are IBM 7094 series, IBM 1400 series and CDC 164 etc.

Advantages

- Smaller in size as compared to the first generation computers.
- The 2nd generation Computers were more reliablz
- Used less energy and were not heated.
- Wider commercial use
- Better portability as compared to the first generation computers.
- Better speed and could calculate data in microseconds
- Used faster peripherals like tape drives, magnetic disks, printer etc.
- Used Assembly language instead of Machine language.
- Accuracy improved.

Disadvantages

- Cooling system was required
- Constant maintenance was required
- Commercial production was difficult
- Only used for specific purposes
- Costly and not versatile
- Punch cards were used for input.

Third Generation Computers (1964-1975)

The Third generation computers used the integrated circuits (IC). Jack Kilby developed the concept of integrated circuit in 1958. It was an important invention in the computer field. The first IC was invented and used in 1961. The size of an IC

is about ¼ square inch. A single IC chip may contain thousands of transistors. The computer became smaller in size, faster, more reliable and less expensive. The examples of third generation computers are IBM 370, IBM System/360, UNIVAC 1108 and UNIVAC AC 9000 etc.

Advantages

- Smaller in size as compared to previous generations.
- More reliable.
- Used less energy
- Produced less heat as compared to the previous two generations of computers.
- Better speed and could calculate data in nanoseconds.
- Used fan for heat discharge to prevent damage.
- Maintenance cost was low because hardware failure is rear.
- Totally general purpose
- Could be used for high-level languages.
- Good storage
- Versatile to an extent
- Less expensive
- Better accuracy
- Commercial production increased.
- Used mouse and keyboard for input.

Disadvantages

- Air conditioning was required.
- Highly sophisticated technology required for the manufacturing of IC chips.

> Fourth Generation Computers (1975-Present)

The fourth generation computers started with the invention of Microprocessor. The Microprocessor contains thousands of ICs. Ted Hoff produced the first microprocessor in 1971 for Intel. It was known as Intel 4004. The technology of integrated circuits improved rapidly. The LSI (Large Scale Integration) circuit and VLSI (Very Large Scale Integration) circuit was designed. It greatly reduced the size of computer. The size of modern Microprocessors is usually one square inch. It can contain millions of electronic circuits. The examples of fourth generation computers are Apple Macintosh & IBM PC.

Advantages

More powerful and reliable than previous generations.

- Small in size
- Fast processing power with less power consumption
- Fan for heat discharging and thus to keep cold.
- No air conditioning required.
- Totally general purpose
- Commercial production
- Less need of repair.
- Cheapest among all generations
- All types of High level languages can be used in this type of computers
 Disadvantages
- The latest technology is required for manufacturing of Microprocessors.

Fifth Generation Computers (Present & Beyond)

Scientists are working hard on the 5th generation computers with quite a few breakthroughs. It is based on the technique of Artificial Intelligence (AI). Computers can understand spoken words & imitate human reasoning. Can respond to its surroundings using different types of sensors. Scientists are constantly working to increase the processing power of computers. They are trying to create a computer with real IQ with the help of advanced programming and technologies. IBM Watson computer is one example that outsmarts Harvard University Students. The advancement in modern technologies will revolutionize the computer in future.

- 3) Give the introduction of each part of the motherboard.
 - ➤ Motherboard power supply connector: this is the main part which supplies power to the other parts of motherboard.
 - **Processor support:** this is the section where the processor is kept or you can say it gets in order to supply instructions to the other parts.
 - ➤ **Processor power supply connectors:** The parts which provide power to the processor it gets power supply from main power supply on motherboard and supplies to processor.
 - ➤ **Input output connectors:** the connectors which are provided for external device like keyboard, mouse, USB, printer, power supply,etc.
 - ➤ Audio chip: the main chip which works for audio sounds you must install audio driver in order to hear specific sound.
 - ➤ **AGP slot:** AGP refer to advance graphics port in an AGP (accelerated graphics port) slot is a Slot is a connector on your motherboard specifically designed for use with the video card.

- ➤ **PCI expansion slots:** PCI (peripheral component interconnect) is an interconnection system between a microprocessor and attached device in which expansion slot are space closely for high speed operation.
- ➤ Chipset-1 and chipset-2: chipset which provides the supporting interface between CPU and the various buses and external components.
- ➤ RAM connectors : you can Mount/install RAM on these connector or you can say sockets
- ➤ Case fan power supply connector: the connectors/slot which provides power to the case fan which keeps cool to internal parts.
- ➤ **Jumpers:** a rubber type parts which is used to detect different IDEs. Depending on the jumpers setting/arrangements, different IDEs are selected or can get preferences.
- ➤ **Disk/floppy drive connectors**: The connectors which works in order to connect any type of disk.
- ➤ **BIOS**: also known as ROM BIOS(read only memory basic input output system) the chip which works very fast as soon as the power is supplied to the motherboard you might have seen that when you start computer
- ➤ CMOS battery: a small better or in easy word if I say a short of small charger which provides power to some important part even when the motherboard/CPU is switched off.