

Assignment No. 1

ICT WORKSHOP

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❖ Difference between Hardware and Software.

Hardware	Software
Hardware is the physical component of the computer which is tangible.	Software can be seen but we can't actually touch them.
These physical components which make up the body of the computer.	These programs can govern the computer system and process the hardware components.
Hardware can't be affected by the computer viruses.	Software can be affected by the computer viruses.
Hardware can't perform any task without software.	Software can't be executed without hardware.
It is manufactured.	It is developed and engineered.
It can't be transferred from one place to another electrically through network.	It can be transferred from one place to another with the help of network.
If hardware is damaged, it is replaced with new one.	If software is damaged, its backup copy can be reinstalled.
It has four main categories: input device, output devices, storage, and internal components.	It is mainly divided into System software, Programming software and Application software.
Ex: Keyboard, Mouse, Monitor, Printer, CPU, Hard disk, RAM, ROM etc.	Ex: MS Word, Excel, Power Point, Photoshop, MySQL etc.

❖ Explain in detail about the Generation of Computer.

1. FIRST GENERATION :

- **1946-1959** is the period of the first generation computer.
- **J.P.Eckert** and **J.W.Mauchy** invented the first successful electronic computer called ENIAC, ENIAC stands for “Electronic Numeric Integrated And Calculator.
- The first generation computers were developed by using **vacuum tube** or **thermionic valve machine**.
- The input of this system was based on punched cards and paper tape; however, the output was displayed on printouts.
- The first generation computers worked on binary-coded concept (i.e., language of 0-1).
- **Ex.** ENIAC, EDVAC, UNIVAC, IBM-701, IBM-650, etc.

2. SECOND GENERATION :

- **1959-1965** is the period of second generation computer.
- Second generation computers were based on **Transistor** instead of vacuum tubes.
- In comparison to the first generation, the size of second generation was smaller. Additionally, the computing time taken by the second generation computers was also lesser.
- Second-generation computers moved from cryptic binary machine language to symbolic, or assembly languages, which allowed programmers to specify instructions in words. High-level programming languages were also being developed at this time, such as early versions of COBOL and FORTRAN.
- **Ex.** Honeywell 400, IBM-7094, CDC-1604, CDC-3600, UNIVAC-1108, etc.

3. THIRD GENERATION :

- **1965-1971** is the period of third generation computer.
- These computers were based on **Integrated circuits**.
- IC was invented by **Robert Noyce** and **Jack Kilby** in 1958-1959.
- IC was a single component containing number of transistors.
- In comparison to the computers of the second generation, the size of the computers of the third generation was smaller.
- In comparison to the computers of the second generation, the computing time taken by the computers of the third generation was lesser. Moreover, third generation computer consumed less power and also generated less heat.
- The maintenance cost of the computers in the third generation was also low.
- The computer system of the computers of the third generation was easier for commercial use.
- **Ex.** PDP-8, PDP-11, ICL 2900, IBM 360, IBM 370, etc.

4. FOURTH GENERATION :

- **1971-1980** is the period of fourth generation computer.
- This technology is based on **Microprocessor**.
- A microprocessor is used in a computer for any logical and arithmetic function to be performed in any program.
- **Graphics User Interface (GUI)** technology was exploited to offer more comfort to users.
- By coming to fourth generation, computer became very small in size, it became **portable**.
- The machine of fourth generation started generating very low amount of heat.
- It is much faster and accuracy became more reliable.
- The production cost reduced to very low in comparison to the previous generation.
- It became available for the common people as well.
- **Ex.** IBM 4341, DEC 10, STAR 1000, PUP 11, etc.

5. **FIFTH GENERATION** :

- The period of the fifth generation in **1980-onwards**.
- By the time, the computer generation was being categorized on the basis of hardware only, but the fifth generation technology also included software.
- The computers of the fifth generation had **high capability** and **large memory capacity**.
- Working with computers of this generation was fast and multiple tasks could be performed simultaneously.
- Some of the popular advanced technologies of the fifth generation include **Artificial intelligence, Quantum computation, Nanotechnology, Parallel processing**, etc.
- The aim of the fifth generation is to make a device which could respond to natural language input and are capable of learning and self-organization.
- This generation is based on **ULSI (Ultra Large Scale Integration)** technology resulting in the production of microprocessor chips having ten million electronic component.
- **Ex.** Desktop, Laptop, NoteBook, UltraBook, Chromebook, etc.

❖ What are the advantages and disadvantages of Computer?

✓ Advantages of a Computer:

- **Multitasking**

Multitasking is one of the major advantage of computer. Person can perform multiple task, multiple operation, calculate numerical problems within few seconds. Computer can perform trillion of instructions per second. For instance, one moment it helps the user to take hard copy the same time it supports the same user to browse the internet and the same user can play the game for entertainment.

- **Increases productivity**

Computers help increase user's productivity, and users become more productive at everything that one can do on the software running on the computer with a good understanding. To make it clear, when a person has work on an Excel worksheet with a basic understanding, one can create, edit, delete, store, calculation, and print documents and letters. With all pre-existing technologies, all of these things were either impossible or much slower.

- **Speed**

Now computer is not just a calculating device. Nowadays computer plays very important role in human life. One of the main advantages of computer is its incredible speed, which helps human to complete their task in few seconds. All the operations can be performed very fast just because of its speed otherwise it takes a long time to perform the task.

- **Remembrance Capacity**

It is a low cost solution. Person can save huge data within a low budget. Centralized database of storing information is the major advantage that can reduce cost. In computer, we can store any type and any amount of information and we can retrieve the same information after the several years because of its storage capability. Therefore, the remembrance capacity of computer is so high.

- **Accuracy**

One of the root advantage of computer is that can perform not only calculations but also with accuracy. Accuracy means the computers are working with the great perfection and making error is the rare scenario for them.

- **Helps sort, organize, and search through information**

A computer system can use its stored information more appropriately as compared to another device. As it is described earlier that a computer can store thousands of books. The stored books on the computer can be organized into alphabetized categories, which help users to find information correctly in less than a minute. If humans try to find certain information manually from hundreds or thousands of books, it will take much time or months.

✓ **Disadvantage of a Computer:**

As we know pros come with cons.

- **Virus and hacking attacks**

Virus is a worm and hacking is simply an unauthorized access over computer for some illicit purpose. Virus is being transferred from email attachment, viewing an infected website advertisement, through removable device like USB etc. once virus is transferred in host computer. It can infect the files, overwrite the files, etc. To cite an example, huge portion of internet was going down including Twitter, Netflix, Reddit and CNN in October 2016 because the largest DDoS attack was launched on service provider DYN using IoT Botnet.

- **Online Cyber Crimes**

Online cyber-crime means computer and network may have used in order to commit crime. Cyber stalking and Identity theft are the points which comes under online cyber-crimes. To demonstrate, one may get the access of the shopping account of a particular company, that person will be able to know one's personal details like debit card or credit card number which can be then misused.

- **Reduction in employment opportunity**

Mainly past generation was not used to with the computer or they do not have the appropriate knowledge of computer that's why they have faced many problems when computer came in field. To make it clear, in the banking sector, senior bank employees are facing big problems operating computers. Above were the main disadvantage of computer, no IQ, Dependency, No feeling, Break down are the basic disadvantages of computer.

- **Short attention span**

Today's almost all people have become hooked on instant gratification with computers, computer devices, and the Internet. It has become a reason to use a computer every day. As a person surfs the Internet on the computer or computer devices and asks any question, it gives immediate answers to the questions that become habituated to getting quick dopamine fix. One can get frustrated easily by not getting answers in a timely manner, or something does not work speedily.

- **Improves employment options**

If a person has a computer and knows how to use a computer, then one can improve employment options and also, one can work from home. For example, sometimes it may be a condition for any organization to allow work from home to their employees. To exemplify, many companies needed their employees to work from home in the 2020 COVID-19 outbreak. Even during the crisis, having a computer at home and knowing how to operate a computer, one can earn easily with adequate skills at home.

- **Can limit learning and create a dependency**

Computer with an Internet connection can be a perfect place to get information about any topic. Getting knowledge about anything makes a person dependent on the computer and other electronic devices. For instance, to find spelling errors, an auto-correct or spell checker is a perfect tool that offers the benefit of finding mistakes and make the correct spelling of a word. On the contrary, if a person always depends on the spell checker or auto-correct tools and never learn the proper spelling of a word, then he/she is more likely to make spelling errors. Also, there are many other helpful tools available, such as GPS, grammar checkers, and calculators. However, a person might be helpless when they are not working if he/she is overly dependent on these tools.

❖ Write in detail about the basic components of computer.

There are five basic components of the computer:

1. Input Unit
2. Output Unit
3. Memory Unit
4. Control Unit
5. Arithmetic & Logical Unit

• **Input Unit**

A computer will only respond when a command is given to the device. These commands can be given using the input unit or the input devices.

For example: Using a keyboard we can type things on a Notepad and the computer processes the entered data and then displays the output of the same on the screen.

The data entered can be in the form of numbers, alphabet, images, etc. We enter the information using an input device, the processing units convert it into computer understandable languages and then the final output is received by a human-understandable language.

• **Output Unit**

When we command a computer to perform a task, it reverts back for the action performed and gives us a result. This result is called output. There are various output devices connected to the computer. The most basic of which is a monitor. Whatever we write using a keyboard or click using a mouse, is all displayed on the monitor.

Thus, the output unit gives us the final result once the entire processing is done within the mechanism of a device.

For example: when we visit an ATM, we enter our details like language, pin, amount to be withdrawn, etc. and then the final money which the cash dispenser releases is our outcome. In this case, the cash dispenser acts as an output unit.

To get a list of computer input and output devices and the function of the various I/O devices, visit the linked article.

For better understanding and more interactive analysis of the components of computer, candidates can check the video given below and get detailed information reading the five major components responsible for the functioning of a computer device.

- **Memory Unit**

When we enter the data into the computer using an input device, the entered information immediately gets saved in the memory unit of the Central Processing Unit (CPU). Because of the presence of some existing programming, the Memory Unit transmits the data further to the other parts of the CPU.

Similarly, when the output of our command is processed by the computer, it is saved in the memory unit before giving the output to the user.

- **Control Unit**

This is the core unit which manages the entire functioning of the computer device. It is one of the most essential components of the computer system.

The Control Unit collects the data entered using the input unit, leads it on for processing and once that is done, receives the output and presents it to the user. It can be said to be the centre of all processing actions taking place inside a computer device.

Basically, the instructions taken, interpretation of entered data, issuing signals to execute the data and then finally retrieving the data is all done in the Control Unit.

- **Arithmetic & Logical Unit**

As the name suggests, all the mathematical calculations or arithmetic operations are performed in the Arithmetic and Logical Unit of the CPU.

It can also perform actions like a comparison of data and decision-making actions. The ALU comprises circuits using which addition, subtraction, multiplication, division and other numerical based calculations can be performed.
