COMPUTER FUNDAMENTALS

DEFINITION

A computer is an electronic machine, which accepts the data from the user, process it and give us the eyesore result in the from of information.

FULL FROM OF COMPUTER

C-Commonly, O-Operating, M-Machine-P-Purely, U-Used In T-Technical E- Education & R-Research

Q-who is the father of computer?

Ans- Charles Babbage.

OPERATING SYSTEM

An operating system is a program which creates a relationship between user and machine & control hardware resource

COMPUTER COMPONENTS

Monitor: The monitor looks like a television screen, except instead of watching television programs on it, the monitor allows for viewing of computer programs. It is connected to the main computer box.

Computer monitors can be categorized as:

1. CRT (cathode ray tube) monitors2.flat screen monitors.(LCD,LED)

Keyboard: The keyboard is similar to a typewriter – it has all of the same keys, along with additional keys for different uses. However, instead of typing onto paper, the text and characters appear on the monitor and operate the computer.

Mouse: The mouse is an input device that functions as a pointing device. It is a small plastic case that fits under your hand. The mouse has made it easy to feed instructions in the computer.

Hard Drive: It is a secondary storage device. In simple terms, it is the place where all our works. Its measurement unit as bellow

8 bit = 1byte

1,024 byte = 1 kilobyte (KB) **1,024 KB = 1 megabyte (MB)**

1024 MB = 1 Gigabyte **1024 GB = 1Terabyte**

1024 TB = 1 Pet byte

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Motherboard: A computer motherboard is a square-shaped board that houses all major components such as the RAM chips, PCI slots, processor, batteries, sound cards, video cards, USB ports and all other internal circuitry.

RAM: "RAM" Stands for Random Access Memory; It is a primary storage device of your computer. Although all your software applications are installed and stored in your hard drive, each one of them needs to make use of the RAM when it is being used. More the number or the size of the applications being run, greater is the RAM requirement of your computer.

Processor: This is the actual brain of your computer.

Cards: These mainly include video cards, sound cards, graphics cards, etc.

Fans: Most computer cabinets make use of at least two fans – a processor fan and a cabinet fan.

CD/DVD Drives: If you wish to run any type of CD or DVD on your computer,

Cables: Last but not the least, the connecting cables. Internal cables which are used to connect the hard drive, CD/DVD drive, floppy drive, etc.

Computer Input Devices

Input devices are that type of device which is use to feed data & give instructions. As

1. Keyboard: 2. Mouse: 3.Scanner:

Computer Output Devices

Output devices are that type of device which is shows and give our results. As

1. Printer: 2.Moniter: 3.speaker

Characteristics of computer

Speed... As you know computer can work very fast. It takes only few seconds for calculations that we take hours to complete

Accuracy... The degree of accuracy of computer is very high and every calculation is performed with the same accuracy. The accuracy level is determined on the basis of design of computer. The errors in computer are due to human and inaccurate data.

Diligence… A computer is free from tiredness, lack of concentration, fatigue, etc. It can work for hours without creating any error.

Versatility… It means the capacity to perform completely different type of work at same time.
Storage… Computer has the power of storing any amount of information or data. Any information can be stored and recalled as long as you require it, for any numbers of years. It depends entirely upon you how much data you want to store in a computer and when to lose or retrieve these data.

Limitations of computer
No Feeling… It does not have feelings or emotion, taste, knowledge and experience. Thus it does not get tired even after long hours of work. It does not distinguish between users.
No IQ…Computer is a dumb machine and it cannot do any work without instruction from the user. It performs the instructions at tremendous speed and with accuracy. It is you to decide what you want to do and in what sequence. So a computer cannot take its own decision as you can

History of computer

History of computer could be traced back to the effort of man to count large numbers. This process of counting of large numbers generated various systems of numeration like Babylonian system of numeration, Greek system of numeration, Roman system of numeration and Indian system of numeration. Out of these the Indian system of numeration has been accepted universally. It is the basis of modern decimal system of numeration (0, 1, 2, 3, 4, 5, 6, 7, 8, 9). Later you will know how the computer solves all calculations based on decimal system. But you will be surprised to know that the computer does not understand the decimal system and uses binary system of numeration for processing. We will briefly discuss some of the path-breaking inventions in the field of computing devices.

1. Calculating Machines

It took over generations for early man to build mechanical devices for counting large numbers. The first calculating device called ABACUS was developed by the Egyptian and Chinese people.

The word ABACUS means calculating board. It consisted of sticks in horizontal positions on which were inserted sets of pebbles. A modern form of ABACUS is given in Fig. 1.2. It has a number of horizontal bars each having ten beads. Horizontal bars represent units, tens, hundreds, etc.

2. Napier's bones

English mathematician John Napier built a mechanical device for the purpose of multiplication in 1617 A D. The device was known as Napier's bones.

3. Slide Rule

English mathematician Edmund Gunter developed the slide rule. This machine could perform operations like addition, subtraction, multiplication, and division. It was widely used in Europe in 16th century.

4. Pascal's Adding and Subtractory Machine

You might have heard the name of Blaise Pascal. He developed a machine at the age of 19 that could add and subtract. The machine consisted of wheels, gears and cylinders.

5. Leibniz's Multiplication and Dividing Machine

The German philosopher and mathematician Gottfried Leibniz built around 1673 a mechanical device that could both multiply and divide.

6. Babbage's Analytical Engine

It was in the year 1823 that a famous English man Charles Babbage built a mechanical machine to do complex mathematical calculations. It was called difference engine. Later he developed a general-purpose calculating machine called analytical engine. You should know that Charles Babbage is called the father of computer.

7 Mechanical and Electrical Calculator

In the beginning of 19th century the mechanical calculator was developed to perform all sorts of mathematical calculations. Up to the 1960s it was widely used. Later the rotating part of

mechanical calculator was replaced by electric motor. So it was called the electrical calculator.

8 Modern Electronic Calculator

The electronic calculator used in 1960 s was run with electron tubes, which was quite bulky. Later it was replaced with transistors and as a result the size of calculators became too small.

The modern electronic calculator can compute all kinds of mathematical computations and mathematical functions. It can also be used to store some data permanently. Some calculators have in-built programs to perform some complicated calculations.

Types of Computer

1. Micro-computer: Microcomputer is at the lowest end of the computer range in terms of speed and storage capacity. Its CPU is a microprocessor. The first microcomputers were built of 8-bit microprocessor chips. The most common application of personal computers (PC) is in this category. The PC supports a number of input and output devices. An improvement of 8-bit chip is 16-bit and 32-bit chips. Examples of microcomputer are IBM PC, PC-AT

2. Mini-Computer: This is designed to support more than one user at a time. It possesses large storage capacity and operates at a higher speed. The mini computer is used in multi-user system in which various users can work at the same time. This type of computer is generally used for processing large volume of data in an organization. They are also used as servers in Local Area Networks (LAN).

3. Main-frames: These types of computers are generally 32-bit microprocessors. They operate at very high speed, have very large storage capacity and can handle the work load of many users. They are generally used in centralised databases. They are also used as controlling nodes in Wide Area Networks (WAN). Example of mainframes are DEC, ICL and IBM 3000 series.

4. Supercomputer: They are the fastest and most expensive machines. They have high processing speed compared to other computers. They have also multiprocessing technique. One of

the ways in which supercomputers are built is by interconnecting hundreds of microprocessors. Supercomputers are mainly being used for whether forecasting, biomedical research, remote sensing, aircraft design and other areas of science and technology. Examples of supercomputers are CRAY YMP, CRAY2, NEC SX-3, CRAY XMP and PARAM from India.

Computer Generations

1. First Generation Computers

First generation computers used Thermion valves. These computers were large in size and writing programs on them was difficult. Some of the computers of this generation were:

ENIAC: It was named Electronic Numerical Integrator and Calculator (ENIAC). The ENIAC was 30 50 feet long, weighed 30 tons.It was built in 1946 in USA by John Eckert and John Mauchy

EDSAC: It stands for Electronic Delay Storage Automatic Computer and was developed by M.V. Wilkes at Cambridge University in 1949.

EDVAC: It stands for Electronic Discrete Variable Automatic Computer and was developed in 1950

UNIVAC-1: Ecker and Mauchly produced it in 1951 by Universal Accounting Computer setup.

Limitations of First Generation Computer

Followings are the major drawbacks of First generation computers.

1. The operating speed was quite slow.
2. Power consumption was very high.
3. It required large space for installation.
4. The programming capability was quite low.

2. Second Generation Computers

Around 1955 a device called Transistor replaced the bulky electric tubes in the first generation computer. Transistors are smaller than electric tubes and have higher operating speed. They have no filament and require no heating. Manufacturing cost was also very low. Thus the size of the computer got reduced considerably.

It is in the second generation that the concept of Central Processing Unit (CPU), memory, programming language and

input and output units were developed. The programming languages such as COBOL, FORTRAN were developed during this period. Some of the computers of the Second Generation were

1.IBM 1620: Its size was smaller as compared to First Generation computers and mostly used for scientific purpose.

2.IBM 1401: Its size was small to medium and used for business applications.

3.CDC 3600: Its size was large and is used for scientific purposes.

3. Third Generation Computers

The third generation computers were introduced in 1964. They used Integrated Circuits (ICs). These ICs are popularly known as Chips. A single IC has many transistors, registers and capacitors built on a single thin slice of silicon. So it is quite obvious that the size of the computer got further reduced. Some of the computers developed during this period were IBM-360, ICL-1900, IBM-370, and VAX-750. Higher level language such as BASIC (Beginners All purpose Symbolic Instruction Code) was developed during this period.Computers of this generations were small in size, low cost, large memory and processing speed is very high.

4 .Fourth Generation Computers

The present day computers that you see today are the fourth generation computers that started around 1975. It uses large scale Integrated Circuits (LSIC) built on a single silicon chip called microprocessors. Due to the development of microprocessor it is possible to place computer's central processing unit (CPU) on single chip. These computers are called microcomputers. Later very large scale Integrated Circuits (VLSIC) replaced LSICs.

Thus the computer which was occupying a very large room in earlier days can now be placed on a table. The personal computer (PC) that you see in your school is a Fourth Generation Computer.

5. Fifth Generation Computer

The computers of 1990s are said to be Fifth Generation computers. The speed is extremely high in fifth generation

computer. Apart from this it can perform parallel processing. The concept of Artificial

Keyboard

Set of keys to instruction to a computer .This is an input device and closely resembles a typewriter with some differences. Mostly 101 or 106 keys . The keyboard has following keys.

1) **ALPHA KEY** :- alphabet keys are marked from A to Z , a to z
2) **FUNCTION KEY**: - there are mark f1 to f12.These keys are used for specific purposes as defined.
3) **NUMERIC KEYS**: - The numeric keys (with the characters 0 to 9) available on the right hand side of keyboard. This keyboard is given for typing convenient only.
4) **OTHER SPECIAL KEYS**: - There are several other keys available on keyboard some of these key are available on typewriter too. These are

a) **Shift key**: - It is used for typing capital characters.

b) **Ctrl and Alt**: - It is combined with different keys. It has a special meaning which depends upon the software being used.

5) **BACKSPACE**: - It is used to leave space between words.

6) **CURSOR KEYS**: - It has 4 key keys left, right, top bottom to move the cursor in the direction indicated.

7) **ENTER**: - It is used to tell the computer to execute certain commands, which you give it also information the computer that the liw.

8) **INSERT**: - It is used to insert characters at the current cursor position.

9):- **DELETE KEY** : - It is used to delete the character to the right of the cursor position.

10) **ESC KEY**:- The escape key is typically enabled as an exit key by most software application. It is cancel a command or return to previous menu.

