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Competitive Exams: Hardware

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Hardware consists of the actual physical components of the computer. The three basic components of a computing system, which are essentially the same regardless of the type of system are: a central processing unit, a primary storage unit, and peripheral devices.

The Central Processing Unit

The component of the computer system that performs processing function is called the central processing unit (CPU) . The CPU is the “brain” of the computer and is composed of two major components: The control unit and the arithmetic/logic unit. The control unit is in charge of the activities of the CPU, It does not process or store data itself, but instructs various parts of the computer in performing these tasks. Instructions given to the computer by the user are interpreted by the control unit, which then sends out signals to circuits within the CPU to execute these instructions. The appropriate input devices are directed to send the user-supplied data to the computer. The control unit also keeps track of which parts of a program have been executed and which ones remain to be executed. Finally, it collects the output and sends it to the designated output device, such as a monitor screen or a printer.

The arithmetic/logic unit (ALU) performs mathematical computations such as addition and multiplication and logical operations. A logical operation is performed by instructing the computer to make a comparison and then to take an action based on the result of that comparison. For example, a program statement might instruct the computer to determine if number X is greater than number Y, and to print X if. This condition is true. If the condition is falsej the program might specify another course of action. Arithmetic and logic operations are the only types of instructions that the ALU is able to execute.

The Primary Storage Unit

The primary storage unit (also referred to as main memory, primary memory, or internal storage) temporarily holds program instruction. Data, and the intermediate and final results of processing. It consists of many storage locations, each of which can hold a small amount of information. Each of these storage locations has a unique address associated with it. This address allows the computer to locate items that have been stored in its memory. Large computers have millions of these storage locations.

Peripheral Devices

Peripheral devices can be divided into three general categories: Input devices, output devices, and secondary storage devices. Programs and data that are entered into a computer to be processed are called input. The word data refers to facts that have been collected but not organized in any meaningful way. When data is processed, or converted to some meaningful form, the result is information. For example, in a national election, the records of all the votes cast for the office of President are data. When these votes are tabulated and the final totals are determined, the result is information.

1. Input devices are used to enter data into the computer so that it can be processed. There are many input devices; some examples are a terminal keyboard, a mouse, a graphics tablet, and a light pen. A given computer system can have many different input devices.
2. Output devices, such as monitor screens and printer, allow the user to examine the computer's output, or processing results. Displaying output on the screen, gives the user the result in a convenient, readable form; this output is referred to as soft copy. However, these results are lost as soon as something else replaces them on the screen. Printing the results on paper, however, gives the user a way of permanently saving this information so that he or she can refer to it at a later time. This output is called hard copy. As with input devices, a particular computer system can have many different output devices.

Computers have only a limited amount of storage space in the primary storage unit because this type of memory is relatively expensive to provide, programs, information, and data that need to be saved for later use can be transferred to secondary storage (also referred to as auxiliary storage) . Secondary storage devices allow programs, data, and processing results to be saved on secondary storage media such as magnetic tape or floppy diskettes. Disk and tape drives are commonly used secondary storage devices. When the computer needs to process these items again, they can be transferred back into the primary storage unit of the computer. Although it takes more time, to access items in secondary storage than those in main memory, secondary storage can store enormous quantities of data at a reasonable cost. In addition to being less expensive than primary storage, the amount of secondary storage available can easily be increased.

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