- Welcome !

CSE211

Computer Organization and Design

Lecture : 3 **Tutorial: 1** **Practical: 0** **Credit: 4**

- **Basics Of Digital Electronics:-**
- Digital Computers**:-**

- The digital computer is a digital system that performs various computational tasks.

- The word digital implies that the information in the computer is represented by variables that take a limited number of discrete values.

- The decimal digits 0, 1, 2, ... , 9, for example, provide 10 discrete values.

- Digital components that are constrained to take discrete values are constrained to take only two values and are said to be binary.

Digital computers use the binary number system, which has two digits: 0 and 1.

A binary digit is called a bit.

A computer system is sometimes subdivided into two functional entities: hardware and software.

The hardware of the computer consists of all the electronic components that comprise the physical entity of the device. -{monitors, CPU}

Computer software consists of the instructions and data that the computer manipulates to perform various data-processing tasks.-{Google Chrome etc.}

Program: A sequence of instructions for the computer is called a program.

The data that are manipulated by the program constitute the data base.

The hardware of the computer is usually divided into three major parts, as shown in Fig. 1-1. The central processing unit (CPU) contains an arithmetic and logic unit for manipulating data, a number of registers for storing data, and control circuits for fetching and executing instructions.

The memory of a computer contains storage for instructions and data. It is called a random access memory (RAM) because the CPU can access any location in memory at random and retrieve the binary information within a fixed interval of time.

The input and output processor (IOP) contains electronic circuits for communicating and controlling the transfer of information between the computer and the outside world. The input and output devices connected to the computer include keyboards, printers.

Block diagram of a digital computer

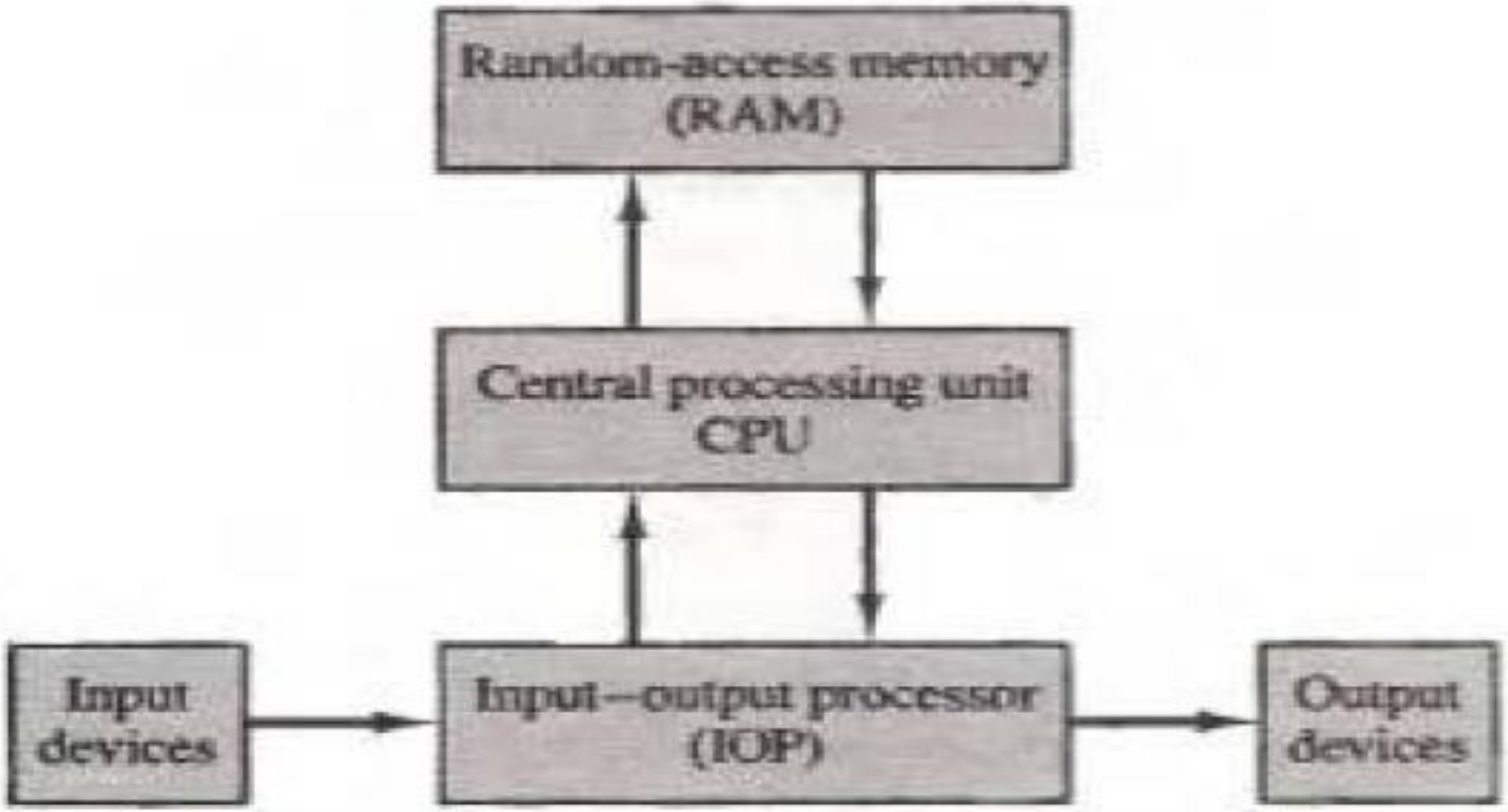

Figure 1-1 Block diagram of a digital computer.

Computer organization is concerned with the way the hardware components operate and the way they are connected together to form the computer system.

Compute design is concerned with the hardware design of the computer. Once the computer specifications are formulated, it is the task of the designer to develop hardware for the system.

Computer architecture is concerned with the instruction and behavior of the computer as seen by the user.

It includes the information formats, the instruction set etc.

The architectural design of a computer system is concerned with the specifications of the various functional modules, such as processors and memories, and structuring them together into a computer system.

Binary information is represented in digital computers by physical quantities called signals .

Electrical signals such as voltages exist throughout the computer in either one of two recognizable states.

The two states represent a binary variable that can be equal to 1 or 0.