SNS COLLEGE OF TECHNOLOGY

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COIMBATORE-35
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME: 19EEB303 - MICROCONTROLLER AND ITS APPLICATIONS

III YEAR / VI SEMESTER

Unit 1 – INTRODUCTION

Lecture   -1

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- Introduction to Microprocessors and Microcontrollers

- Architecture of 8086

- Intel MCS-51 family features

- ATMEL Processor

- 8051 -organization and architecture

- Addressing modes
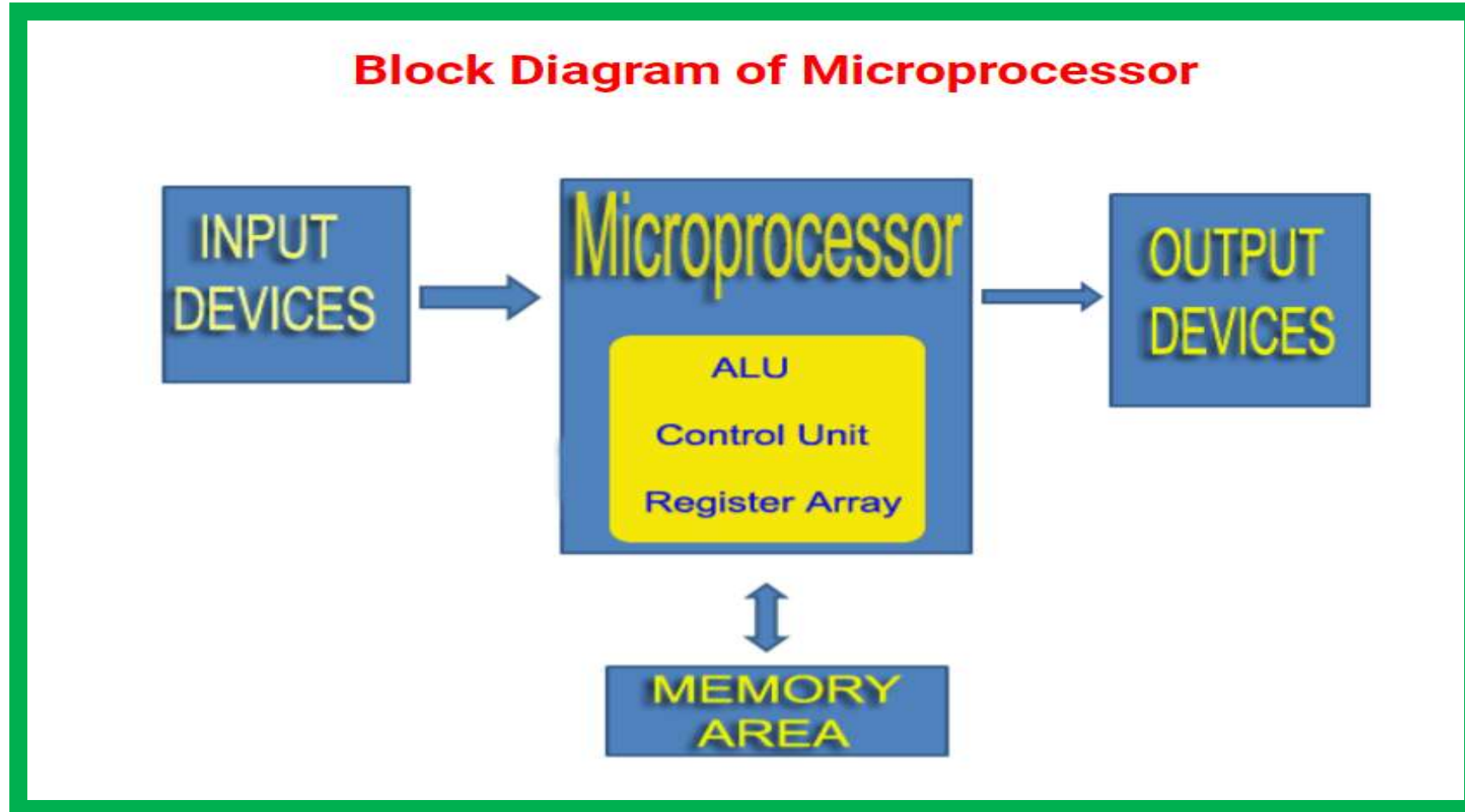
- Instruction set format

- Interrupts

- Microprocessor is a type of computer processor in which both the data processing logic and control are included on a single integrated circuit or on small numbers of integrated circuits.
- These processors consist of logic, control and arithmetic circuits.
- Its integrated circuit is capable of interpreting and executing program instructions.
- These are multiple-purpose, clock-driven and register-based digital integrated circuits that accept input in binary data and process it as per the instruction stored in its memory.

MICROPROCESSOR

Block Diagram of Microprocessor

| INPUT DEVICES | → | Microprocessor | → | OUTPUT DEVICES |

Microprocessor contains: ALU, Control Unit, Register Array

MEMORY AREA

Components of a Microprocessor
A microprocessor has the following components
1.I/O Units
2.Control units
3.Arithmetic Logic Unit (ALU)
4.Cache
5.Registers

- **I/O (Input/Output)** is an information processing system designed to send and receive data from a computer hardware component, device, or network.
- Data can be sent between devices over a network.
- Without I/O, computers would not be able to communicate to other systems or devices.
- **The control unit (CU)** is a component of a computer's central processing unit (CPU) that directs the operation of the processor. It tells the computer's memory, arithmetic/logic unit and input and output devices on how to respond to a program's instructions.

• controlling unit of a micro-computer, fabricated on a small chip capable of performing ALU operations and communicating with the other devices connected to it.

• consists of

➢ ALU - arithmetical and logical operations on the data received from the memory or an input device.

➢ Register array- consists of registers identified by letters like B, C, D, E, H, L and accumulator.

➢ Control unit- controls the flow of data and instructions within the computer.

- **Cache memory** is a small-sized type of volatile computer memory that provides high-speed data access to a processor and stores frequently used computer programs, applications and data.

- A temporary storage of memory, cache makes data retrieving easier and more efficient.

- **Registers** are a type of computer memory built directly into the processor or CPU (Central Processing Unit) that is used to store and manipulate data during the execution of instructions. A register may hold an instruction, a storage address, or any kind of data

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WORKING OF MICROPROCESSOR

- The microprocessor follows a sequence:
  - ➤ Fetch,
  - ➤ Decode
  - ➤ Execute.
- Initially, the instructions are stored in the memory in a sequential order.
- The microprocessor fetches those instructions from the memory, then decodes it and executes those instructions till STOP instruction is reached.
- Later, it sends the result in binary to the output port.
- Between these processes, the register stores the temporarily data and ALU performs the computing functions.

•Microprocessor consists of only a Central Processing Unit, whereas Micro Controller contains a CPU, Memory, I/O all integrated into one chip.

•The microprocessor is useful in Personal Computers whereas Micro Controller is useful in an embedded system.