# SNS COLLEGE OF ENGINEERING

Kurumbapalayam (PO), Coimbatore – 641 107
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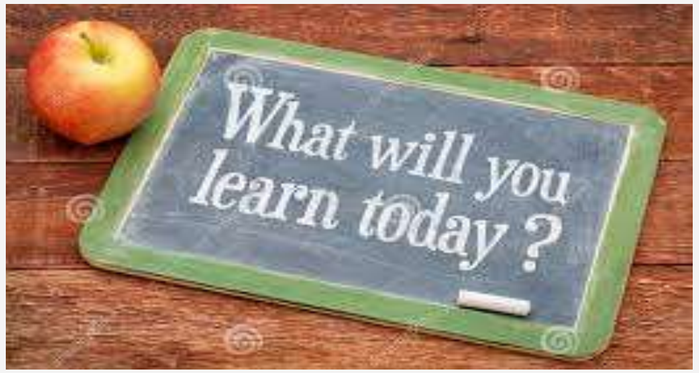
## DEPARTMENT OF INFORMATION TECHNOLOGY

## COURSE NAME: 19IT301 COMPUTER ORGANIZATION AND ARCHITECTURE

## II YEAR/ III SEM

## Unit 1 : BASIC STRUCTURE OF COMPUTERS Topic 1:

## Functional units



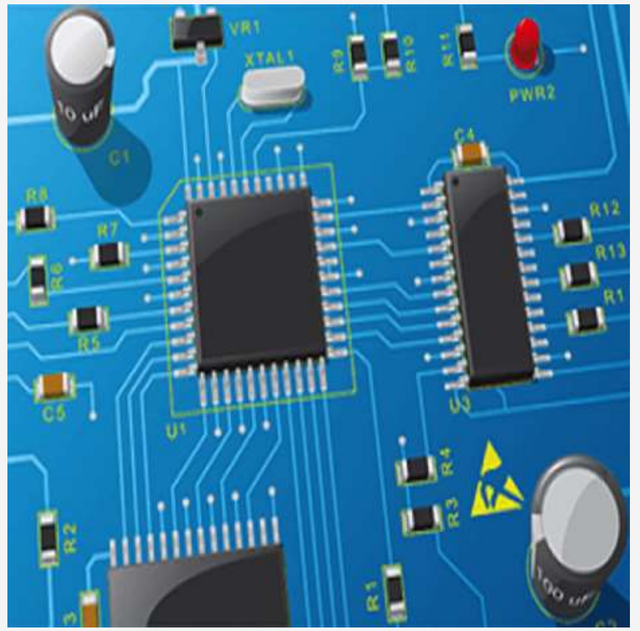

- Computer types
- Common Terminology
- Functional units of Computer Architecture

# Computer architecture

Definition:

It is a set of rules that describes the functionality, organization and implementation of computer systems.

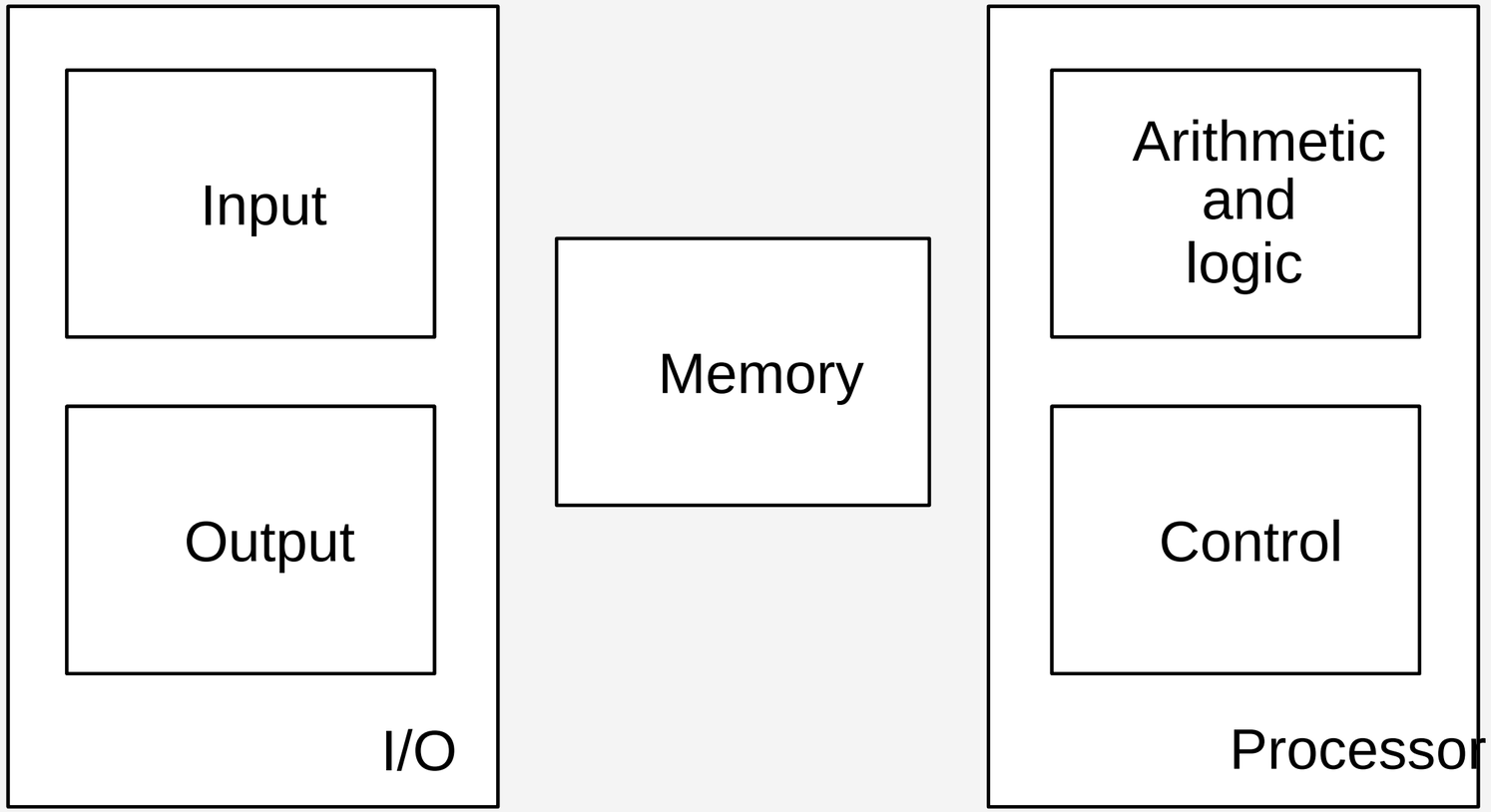
- Computer Hardware – Electronic circuits
- Computer Architecture – Instruction set



# Computer Types

- Desktop/laptop computers
  - ✓ General purpose, variety of software
  - ✓ Subject to cost/performance tradeoff
- Workstations
  - ✓ More computing power used in engg. applications, graphics etc.
- Enterprise System/ Mainframes
  - ✓ Used for business data processing
- Server computers (Low End Range)
  - ✓ Network based
  - ✓ High capacity, performance, reliability
  - ✓ Range from small servers to building sized
    - Supercomputer (High End Range)
      - ✓ Large scale numerical calculation such as weather forecasting, aircraft design
    - Embedded computers
      - ✓ Hidden as components of systems
      - ✓ Stringent power/performance/cost constraints

# Functional Units




Basic functional units of a computer

# Information handled by a Computer

Categorize information as instructions and data:

Instructions/machine instructions

- Govern the transfer of information within a computer as well as between the computer and its I/O devices
- Specify the arithmetic and logic operations to be performed
- Program

Data

- Used as operands by the instructions
- Source program

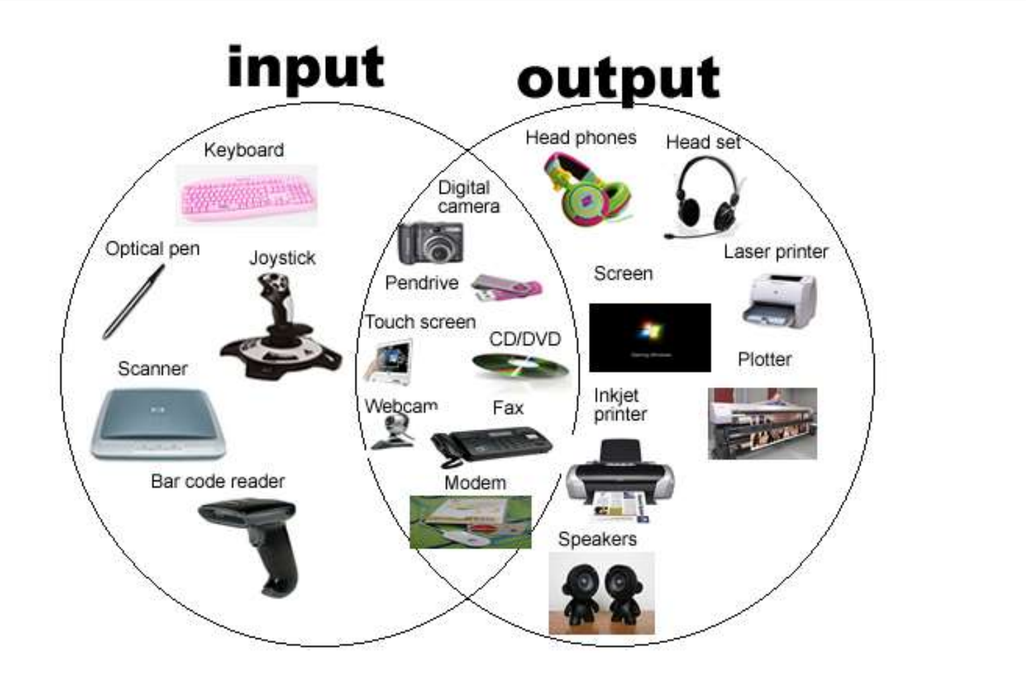
Encoded in binary code – 0 and 1

- BCD – 4 bit
- ASCII – 7 bit
- EBCDIC – 8 bits

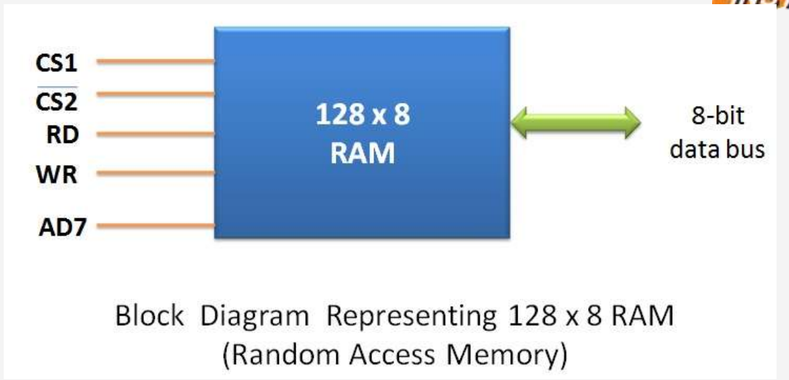
# Input and Output unit

- Input unit accepts coded information.
- Example: Keyboard, Mouse,

- Processed results send to the outside world.
- Example: Printer, Monitor



# Memory Unit



Block Diagram Representing 128 x 8 RAM
(Random Access Memory)

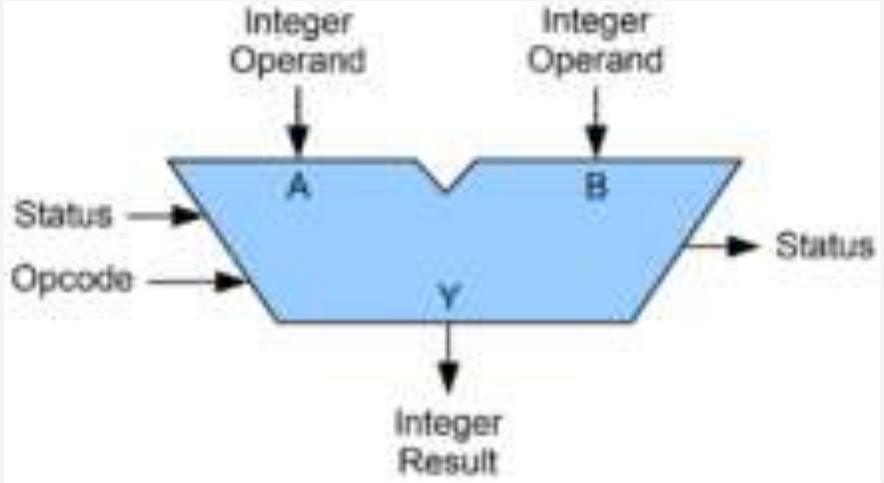
- Store programs and data

Two classes of storage

1. **Primary storage**
   - Fast
   - Programs must be stored in memory while they are being executed
   - Large number of semiconductor storage cells
   - Processed in words
   - Address
   - RAM and memory access time
   - Memory hierarchy – cache, main memory
2. **Secondary storage** – larger and cheaper

# Arithmetic and Logic Unit (ALU)

- Most computer operations are executed in ALU of the processor.
  - Load the operands into memory
  - bring them to the processor
  - perform operation in ALU
  - store the result back to memory or retain in the processor.
- Registers



# Control Unit

- All computer operations are controlled by the control unit.
- The timing signals that govern the I/O transfers are also generated by the control unit.
- Control unit is usually distributed throughout the machine instead of standing alone.

**Operations of a computer:**

- Accept information in the form of programs and data through an input unit and store it in the memory
- Fetch the information stored in the memory, under program control, into an ALU, where the information is processed
    - Output the processed information through an output unit
    - All activities inside the machine are directed through a control unit

# Assessment

1. The _____ format is used to store the data

a. BCD b. Decimal c.Hexadecimal D. Octal

2. The only language which the computer understands is _____

a) Assembly Language b) Binary Language

c) BASIC d) C Language

3. The control unit control other units by generating

a. Control Signals b. Timing Signals

c. Transfer Signals d. Command Signals

4. Which of the following is not a function of the Input Unit?

a) It reads instructions and data from the outside world

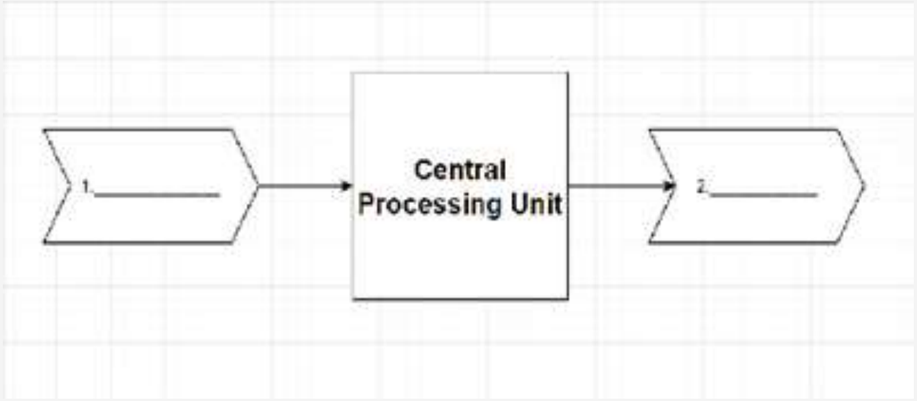
b) It converts the data into computer acceptable format

c) It makes the data into user understandable format

d) It supplies the data and instructions to the computer for further processing

# Assessment

5. Label the parts 1 and 2:




a) 1.ALU 2. MU
b) 1.Output unit 2.Input Unit
c) 1.MU 2. ALU
d) 1.Input Unit 2.Output Unit

Thank You