# Assignment - 1

Q.1 Describe the structural overview of computer.

⇒ All computer types have the same basic computer structure and function. They all follow basic operations. These operations are responsible for converting raw input data into some information that is useful for the users of computers. This basic structure includes an input unit, CPU (central processing unit) & output unit.

1] Input unit :

Input units are the components or devices of the computer by which we can enter any data into the computer. Input devices are responsible for translating all the information that we add to the computer into a form only understood by the computer.

2] CPU (central processing unit)

The central processing unit or CPU is known as the computer's brain. The CPU plays an import role in forming the basic structure of computers. CPU. The CPU is responsible for storing data, intermediating results and instructions

of programs.
A CPU has three components. These three components are
1. control unit
2. The memory unit
3. ALU or arithmatic logic unit

3] output unit :
The device that helps us get all the required information form the computer is known as the output unit. The output unit acts as a linkage between users as well as computers.

4] Memory unit :
A memory unit is a place where all the data such as programs as well as files are stored.
Two types of memory units are main. These two types are RAM or random access memory and Rom or Read only memory.
RAM is responsible for storing data when used. Where as Rom is responsible for retaining data when power is not provided. The type of memory and the size of memory

determines the performance of the system of computers. They also form the basic structure of computers.

5] Control unit :
central processing unit (CPU), but there is one more component that affects the processing of data. This unit is known as control unit. The control unit does not receive any form of input from users ; rather it is responsible for sending commands to other computer computer.

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Q.2 Define stored program concept and Explain von Neumann's Architecture with diagram.

⟹ In the generation originators of ENIAC designed the first stored program computer named EDVAC (electronic Discrete variable computer) and the EDVAC project was further developed by von-Neumann machine with his collaborator at the Institute for Advanced studies (IAS) in princeton

General von Neumann machine consists of following components:

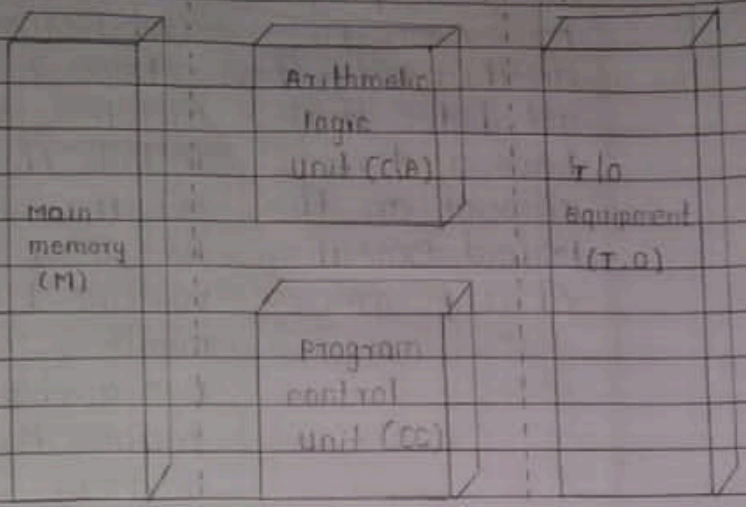
A main memory:
Data storage is one of the core functions and fundamental components of main memory, which stores both data and instructions.

- An arithmetic and logic unit (ALU): capable of operating on binary data.

- A control unit: which interprets the instructions in memory and class causes them to be executed.

- Input and output (I/O): equipment operated by the control unit.

Von Neumann memory unit consists of 4096 storage location ($2^{12} = 4096$) of 40-bit each referred to as words these memory locations are used to store data as well as instructions




General structure of Von-Neuman machine

Q.3 what is in general term. is the distinction between computer architecture and organization?

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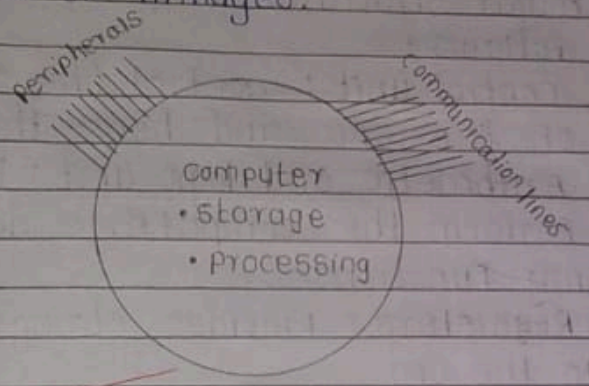
| computer architecture | computer organization |
| --- | --- |
| 1] computer architecture refers to those attributes | computer organization refers to the operational units and |

| | |
|---|---|
| of a system visible to a programmer or, put another way, those attributes that have a direct impact on the logical execution of a program. | their interconnections that realize the architectural specifications. examples of architectural attributes include the instruction set, the number of bits used to represent various data types (eg. numbers, characters), I/o mechanisms, & techniques for addressing memory.<br>2] organizational attributes include those hardware details transparent to the programmer, such as control signals. |

Q.4 Explain the computer the top level structure with structural component with neat sketch diagram.

→ Following fig is the simplest possible diagram of a computer interacts in same fashion with its external

environment In general all of its linkage to the external environment can be classified as peripheral device or communication lines we will have something to say about both types of linkages.




The computer

interconnection is by mean of a system bus, consisting of a number of conducting writes to which all the other components attach there may be one more of each of the a formentioned components tradinally, there has been just a singal processor in recent years, there has been just a singal increasing use of multiple processor crop up and are discussed as the next proceeds part five focuses on such computes.

Each of these components will be examined in some detail in part two however, for our purpose the most interesting and in some ways the most complex component is the CPU. Its major structural components are as follows:

Control unit: control the operation of the CPU and hence the computer

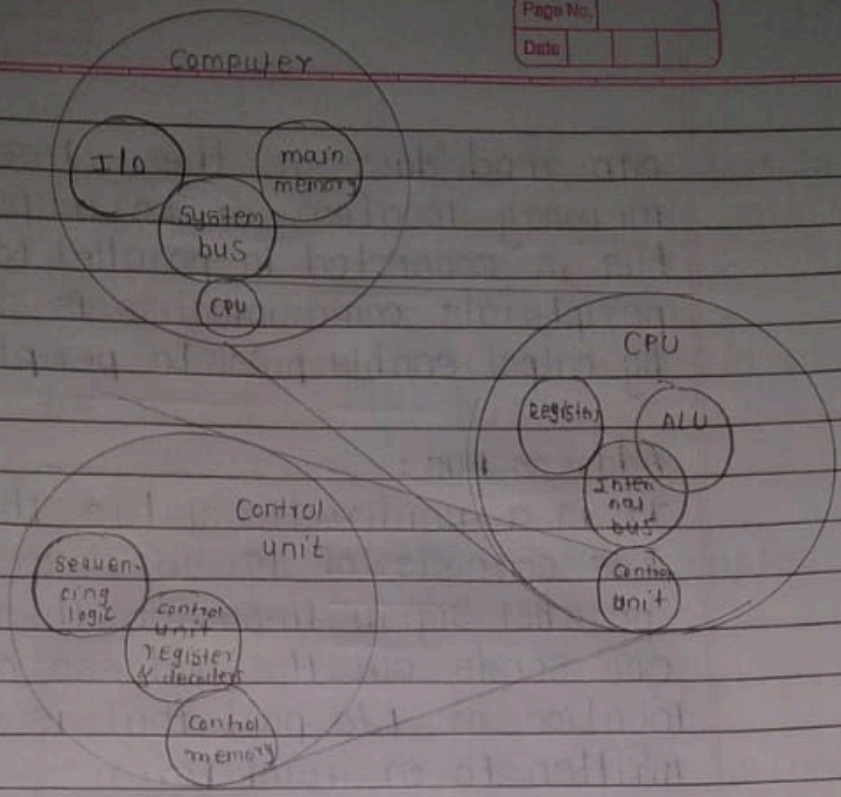
Arithmetic and logic unit: [ALU] perform the computer's data processing functions.

Registers: provides storage internal to the CPU.

CPU interconnection: some mechanism that provides for communication among the control unit ALU and registers.

Q.5 =>

each of these components will be examined in some detail in part three. where we will see that complexity is added by the use of parallel and pipelined organizational techniques finally there are several approaches to the implementation of the control unit one common approch is microprogrammed implementation.




Q.5 Explain generation of Computer and BUS inter connection.

=> It consists of typically 50 to 100 separate lines. Each line is assigned a particular line of function. BUS lines are classified on the three functional group.

1] Data BUS
2] address BUS
3] Control BUS

1] Data BUS :

consists of 8, 16, 32 or more parallel signal lines. The data bus lines are bidirectional. This means CPU can

can read data on these lines to a memory location or to a port. Data bus is connected in parallel to all peripherals communication is activated by output enable pulse to peripheral

Address Bus:
It is a unidirectional bus. The address bus consists of 16, 20, 24 or more parallel signal lines. on these lines the CPU sends out the address of memory location or I/O port that is to be written to or read form.

Control Bus:
The control lines regulate the activity on the bus. The CPU sends signals on the control bus to enable the outputs of addressed memory devices. Typical control bus signals are:
Memory write:
Causes the data on the bus to be written into the addressed location

Memory Read:
causes data from the addressed location to be placed on the bus

I/O Write : causes data on the bus to be output to the addressed I/O port

I/O Read :
Causes data from the addressed I/O port to be placed on the bus.

Transfer Ack :
Indicates that data have been accepted from or placed on the bus.

Bus Request :
Indicates that a module needs to gain control of the bus

Bus Grant : Indicates that a requesting module has been granted control of the bus.

Interrupt Request :
Indicates that an interrupt is pending

Interrupt Ack: Acknowledges that the pending interrupt has been recognized.

clock : used to synchronize operations.

Reset : Initializes all modules.

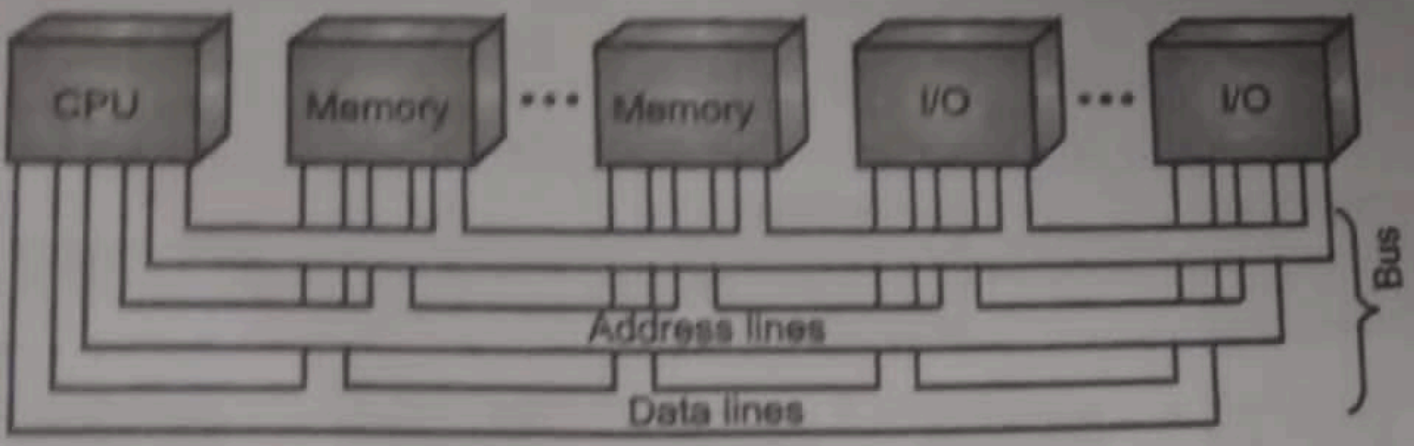



**Fig. 1.12 : Bus interc ɔnnection**