Functional Units

→ A computer consists of 5 functional parts

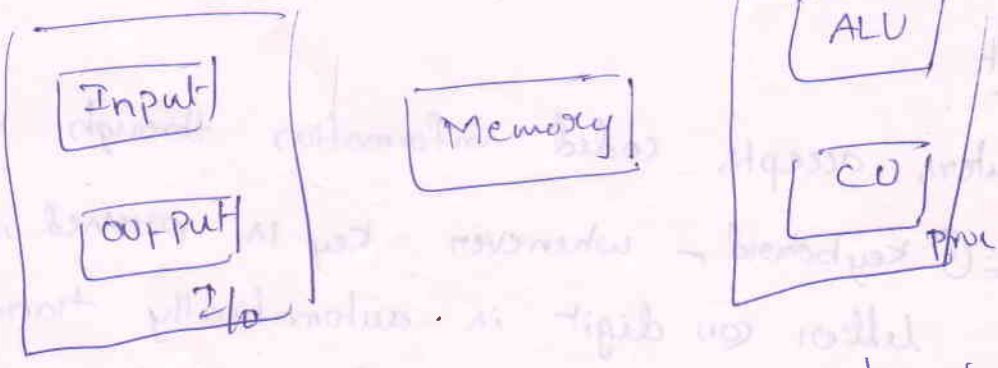
Input unit } I/o unit
output unit
Memory unit
Arithmetic and logic unit } → processor.
control unit

→ Input unit accepts coded information from human operator (or) from electromechanical devices (keyboard) (or) from other computers over digital communication lines.

→ The received information stored in the computer's memory for later references (or) immediately used by the ALU to perform the desired operations.

→ Results are sent back to the outside world through the output unit.

→ All of the above actions are ~~controlled~~ coordinated by the control unit.



connections b/w these units can be made in

(2)

→ Information is categorized as either Instructions (or) data.

→ Instructions are explicit commands that

(1) Govern the transfer of information within a computer as well as between the computer and its I/O devices.

(2) Specify the ALU operation to be performed.

→ A list of instructions that perform a particular task is called a program. Usually program stored in the memory. ∴ processor gets one by one instruction and performs the desired operation.

The computer completely controlled by the stored program.

→ Data are numbers and encoded characters that are used as operands by the instructions

Even ~~Sometimes~~ the entire program considered ~~to be~~ as data if it is processed by another program.

Input Unit

→ computers accepts coded information through input units.

Ex: (1) Keyboard - whenever key is pressed, the corresponding letter (or) digit is automatically translated into its corresponding binary code and transmitted to the

Ex: (2) joysticks, trackballs, mouses - used as graphic input devices in conjunction with display.

(3) Microphones - used to capture audio input

Memory unit

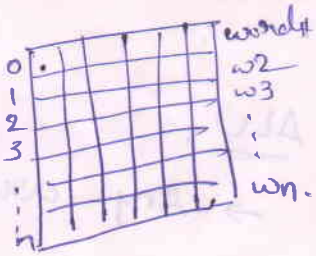
→ There are 2 classes of storage

(1) primary storage - * Fast memory
* programs must be stored in the memory while they are being executed.

* It contains large no. of semiconductor storage cells, each can store one bit at a time.

* These cells processed in groups of fixed size called words.

* To access words from memory a distinct address is associated with each word location



The no. of bits in a word is word length.
Ex: 16 to 64 bits.

→ The capacity of the memory is one factor to categorize the size of a computer.

→ The memory in which any location can be reached in a short and fixed amount of time after specifying is called Random-access Memory (RAM).

→ The time required to access one word is called the memory access time.

→ The memory of a computer is normally implemented as a memory hierarchy of 3 or 4 levels of semiconductor RAM units with different speeds and sizes.

→ The small RAM units are called caches. That are contained on the same integrated circuit chip to achieve high performance.

Secondary storage – It is used when large amounts of data and to be stored.

ex: magnetic disks
tapes
optical disks

ALU:

→ Any arithmetic and logic operations are initiated by bringing the required operands into the processor, where the operation is performed by ALU.

→ When operands are brought into the processor, they are stored in high-speed storage elements called registers.

→ Each register can store one word at a time.

→ Access time to registers. some what faster than access time to cache.

→ The control unit and ALU are many times faster than other devices connected to a computer system. It enables the processor to control the external devices such as keyboard, displays, magnetic disks, etc...

output unit

→ Its function is to send processed results to the outside world.

ex:- printer.

→ some units provide both an O/P function and an I/P function.

ex:- graphic displays.

control unit

→ control unit sends control signals to other units and senses their states.

→ I/O transfers are controlled by the instructions of I/O programs that identify the devices involved and the information to be transferred.

→ Timing signals are generalid by the control unit.

→ Timing signals govern the transfers, that determine when a given action is to take place.

→ Data transfers between the processor and the memory are also controlled by the control unit through