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COMPUTER ORGANISATION.

Chetan W. Palade (I.E.S).

MADE EASY

INDIAN ENGINEERING SERVICE (IES)

+

GATE.

Syllabus. GATE

1) Machine Instruction and Addressing Modes.

2) ALU.

3) Data Path and control unit.

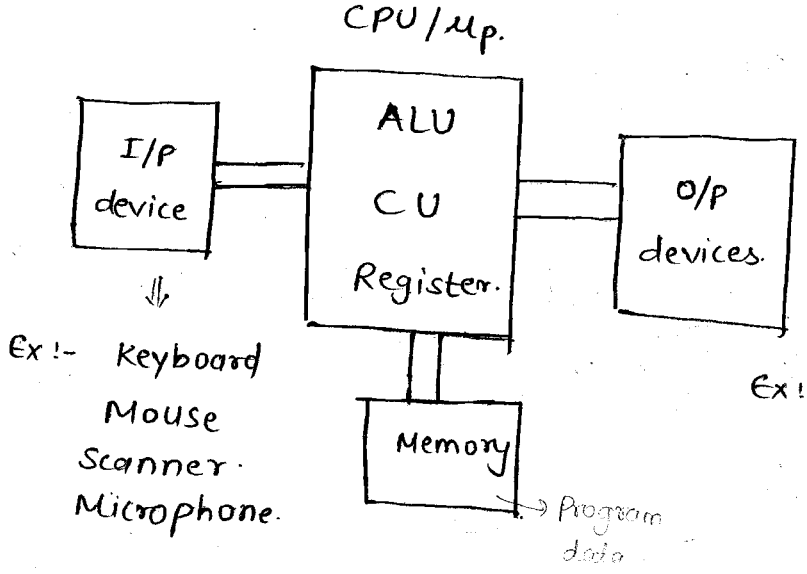
4) Instruction pipelining.

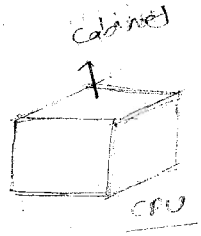
- Vijay Sir

* Computer purposes

- Speed in calculations.
- Data storage.
- Data movement.
- Data procasting.
- Data control

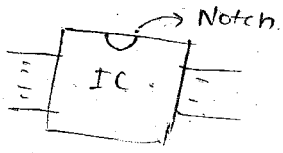
Basic block diagram of a computer.





* Microprocessor :-

It is a semiconductor component design- by using VLSI technology. and it contain ALU, CU and register in a single package. (IC).



Ex:- 8085, 8086, 80486.

µp

I generation → Vaccum tubes ai

II → Transistor

III → SSI { MSI : SSI → < 10 transistor.
MSI → 10 - 100.
LSI → 100 - 1 k
VLSI → > 10 k.
ULSI →
SLSI →

IV → LSI { VLSI.

V → VLSI

Bit → Binary digit 0/1.

Nibble → 4 bits ,0110.

Byte → 8 bits

Word Length → (Depend on Types of µp)
↳ Number of bits that can be processed by a processor parallely in the ALU.

971 - Intel 4004 → 4 bits

Intel 8008 → 8 bits

Intel 8080 → 8 bits

Intel 8085 - 8 bit.

Intel 8086 - 16 bit

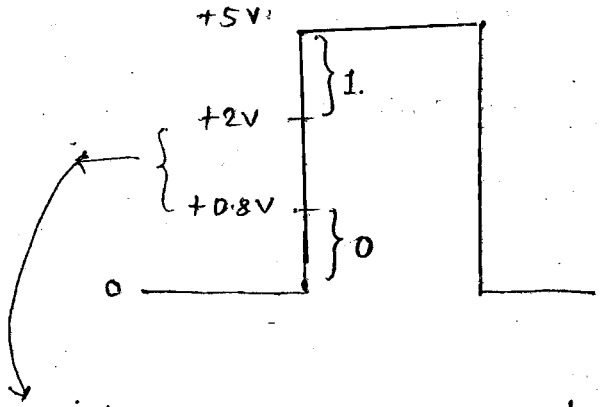
80186, 80286 - 16 bit

Intel 80386 - 32 bit µp.

Pentium + Dual core. → i_3.

Ex:- 8 bit µp → 8 bits / 1 Byte.
16 bit µp → 16 bits / 2 Bytes.

TTL → Transistor - Transistor logic.

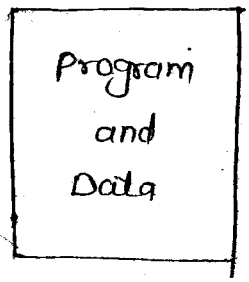


Indefinite levels → These are to be avoided by using a Tri-state buffer. → (interfacing component)

⇒ Based on how programs and data are stored in memory there are two types of architecture.

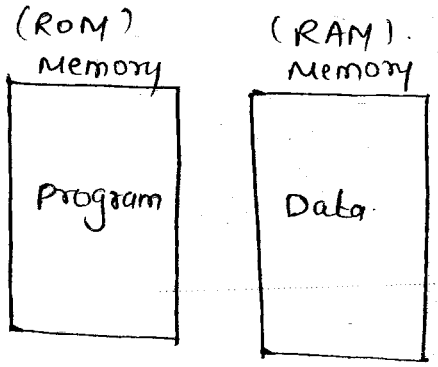
① Von - Neumann or Princeton Architecture.

② Harvard Architecture.



Von - Neumann (or) Princeton Architecture.

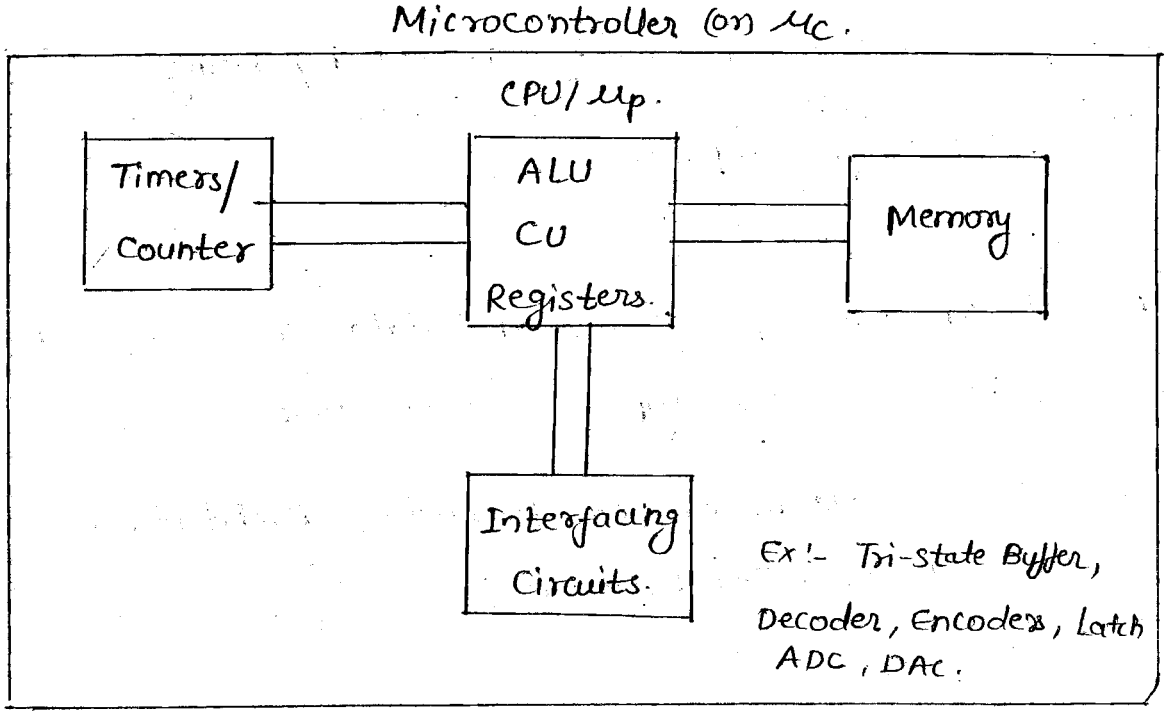
Ex :- Intel 8086
Intel 8085



Harvard Architecture.

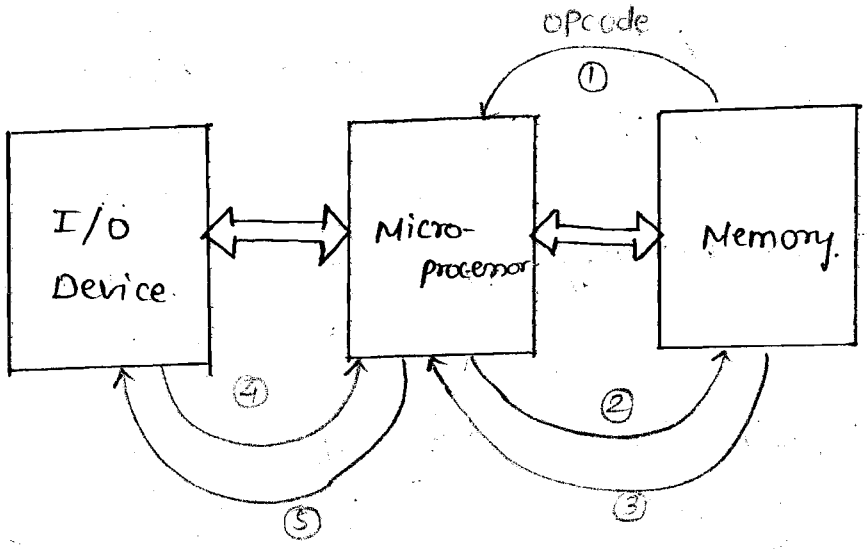
Ex :- Intel 8051.
↓
Microcontroller.

Note :- For Basic microprocessor memory is connected externally for latest processors, memory can also be present in the processor (inside) to store frequently use data and instruction is known as Cache Memory.



Microprocessor (μp)	Microcontroller (μc).
(1) It contain ALU, CU and registers of μp.	(1) It has ALU, CU and registers.
(2) No internal memory	(2) It has internal /on board memory.
(3) No interfacing circuits, {Timers / counters}	(3) It has interfacing circuits, Timer / counters.
(4) Used for general purpose application	(4) Used for specific purpose applications.
(5) Intel 8086, Intel 8085, i7, Zpo, i5, Qualcomm (mobile). Ex: Mobile application	(5) Intel 8051 (8 bit), Intel 80196 (16 bit). Toshiba, PIC. Ex:- Mouse, Oven, Washing Machine.
(6) follows Von-Neumann (or) Princeton Architecture	(6) follows Harvards Architecture.

* Basic operation of a Microprocessor.



Program and Data → Instruction.

↓

Opcode.
(operation code).

↑ operand.

Mov A, B

Assembler.

↓

Machine code.

7811 → 01111000.

① opcode. fetch

② Memory Read

③ M/M Write

④ I/o Read. → i/p device (or) i/p port from.

⑤ I/o Write → from up → o/p port.