Difference between Mp v Mc?

| Microprocessor	Microcontroller
• It is a heart of computer system	• It is the heart of the embedded system.
• Here memory and I/O components need to be connected externally. (তাই আলাদা chip)	• It has a processor along with internal memory and I/O components. (একই চিপে)
• Memory and I/O has to be connected externally, so the circuit becomes large.	• Memory and I/O already present and the internal circuit is small.
• Cost of the entire system is high.	• Cost of the entire system is Low.
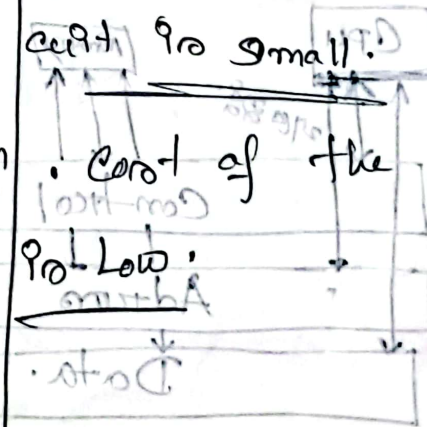
Micro-Controller

Seg 7

Microcontroller is a Intregrated circuit where
Cpu, ALU, Registers, Memory, Serial communication
Timer, Counter, I/O, are included for executing
specific tasks.

Feature of Microcontroller 8051.

- 8051 is complete computer system built on one chip.

- 8051 operates at 12 MHz clock frequency

- 8051 has 8 bits of ALU.

- 8051 has 8 bits of Data Bues.

- 8051 follows harvard Architecture (separate memory for data storage etc)

- 8051 has 4kB of Internal ROM for program storage

- 8051 has 128 bytes of RAM for data storage

- 8051 has four 8 bits of IO ports

Program status Enable,
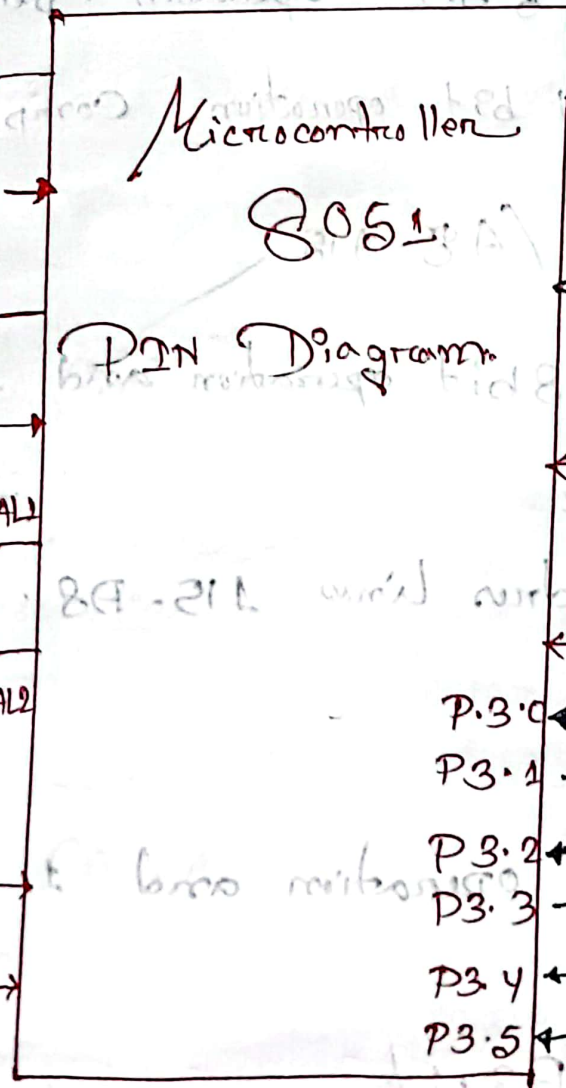RD& WR Read and write
External memory.

PSEN ← → Port 0 { P0.0 - P0.7 }
Microcontroller
8051 AD7 - AD0

Enable
External accur — $\overline{EA}$ → Port 1. { P1.0 - P1.7 }

Seperate addres → ALE ←
and data PIN Diagram
Reading → Reset →
Program Port 2 { P2.0 - P2.7 }
AD15 - AD8

XTAL1
Oscealator 12MHZ Port 3 { P3.0 - P3.7 }
input
XTAL2
P3.0 ← Serial data input (RxD)
P3.1 → Serial data output (TxD)
(5) Vcc → P3.2 ← $\overline{INT0}$ } Interrupts.
P3.3 → $\overline{INT1}$
(gnd) Vss → P3.4 ← T0 } Timer clock input
P3.5 ← T1

Block Diagram . 8051

External Interrupt .

Add range 0000H to 0FFFH

166 to both

| Interrupt Control | 4kB ROM | 128 byte RAM | Timer 1 Timer 0 | Timer Clock input |

CPU

| Oscillator | bus Control | Four I/O Ports | Serial Ports |

XTAL1 ⎵ XTAL2

8 bit

P0 P2
address/data

P1 P3

Txd & RxD.

32 bits.

12 MHZ
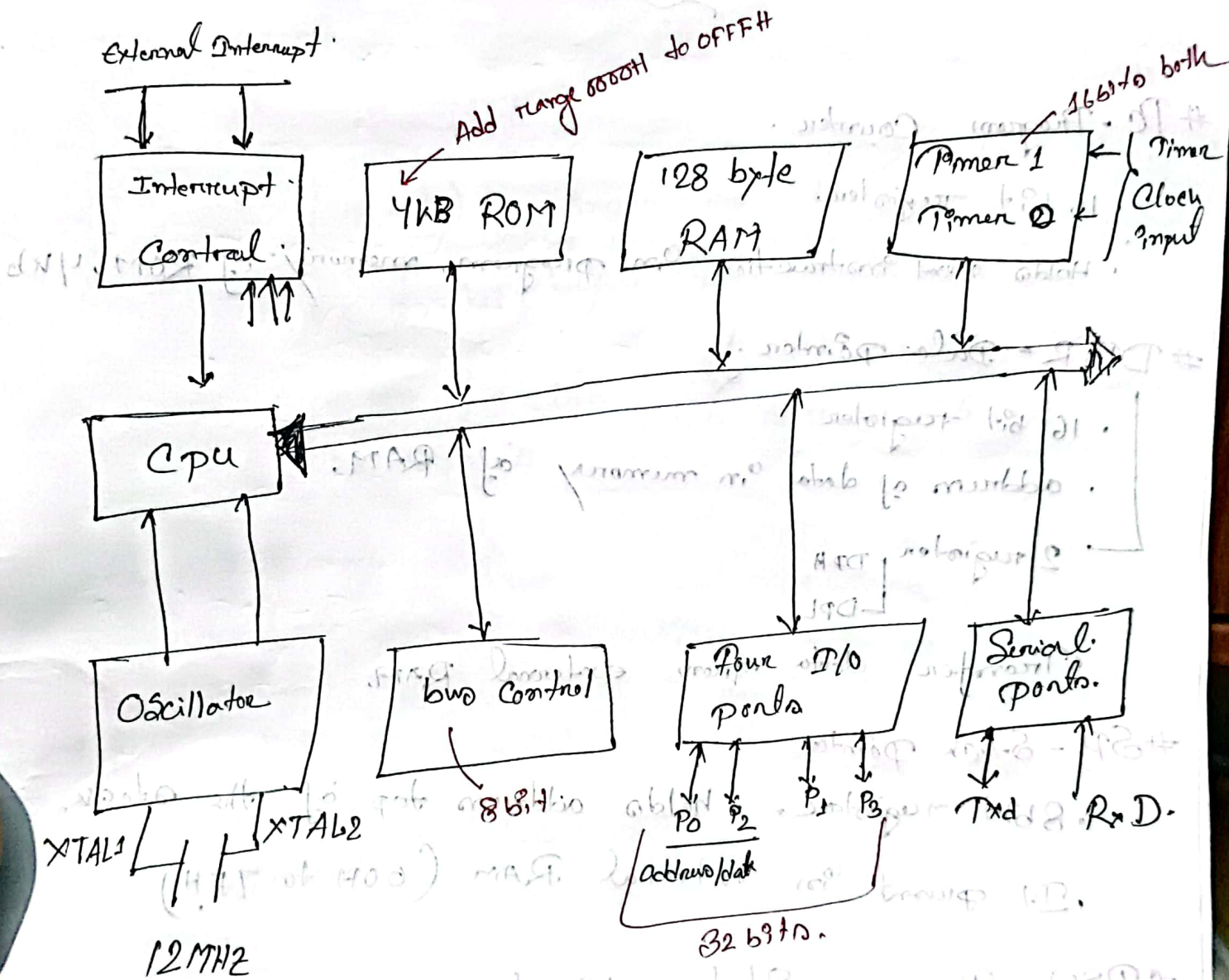
Cpu is responsible for all arothmatic logic task.

Components of 8051

 # PC - Program Counter.

- 16 bit register
- Holds next instruction in program memory of ROM, 4kb

 # DPTR - Data Pointer.

- 16 bit register
- address of data in memory of RAM.
- 2 register ┌ DPH
              └ DPL

- Transfer data from external RAM.

 # SP - Stack Pointer

- 8 bit register • holds address top of the stack.
- It present in internal RAM (00H to 7F.H)

 # PSW - Program Status word.

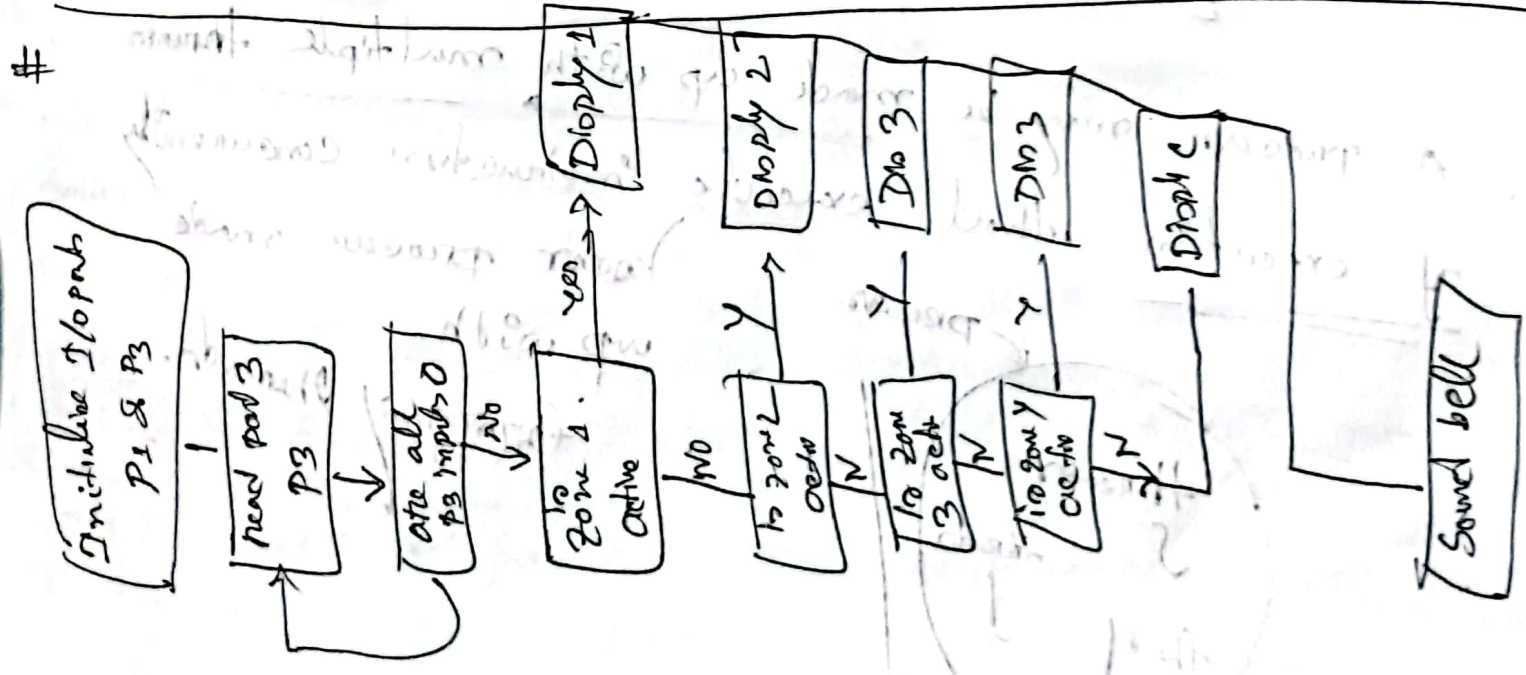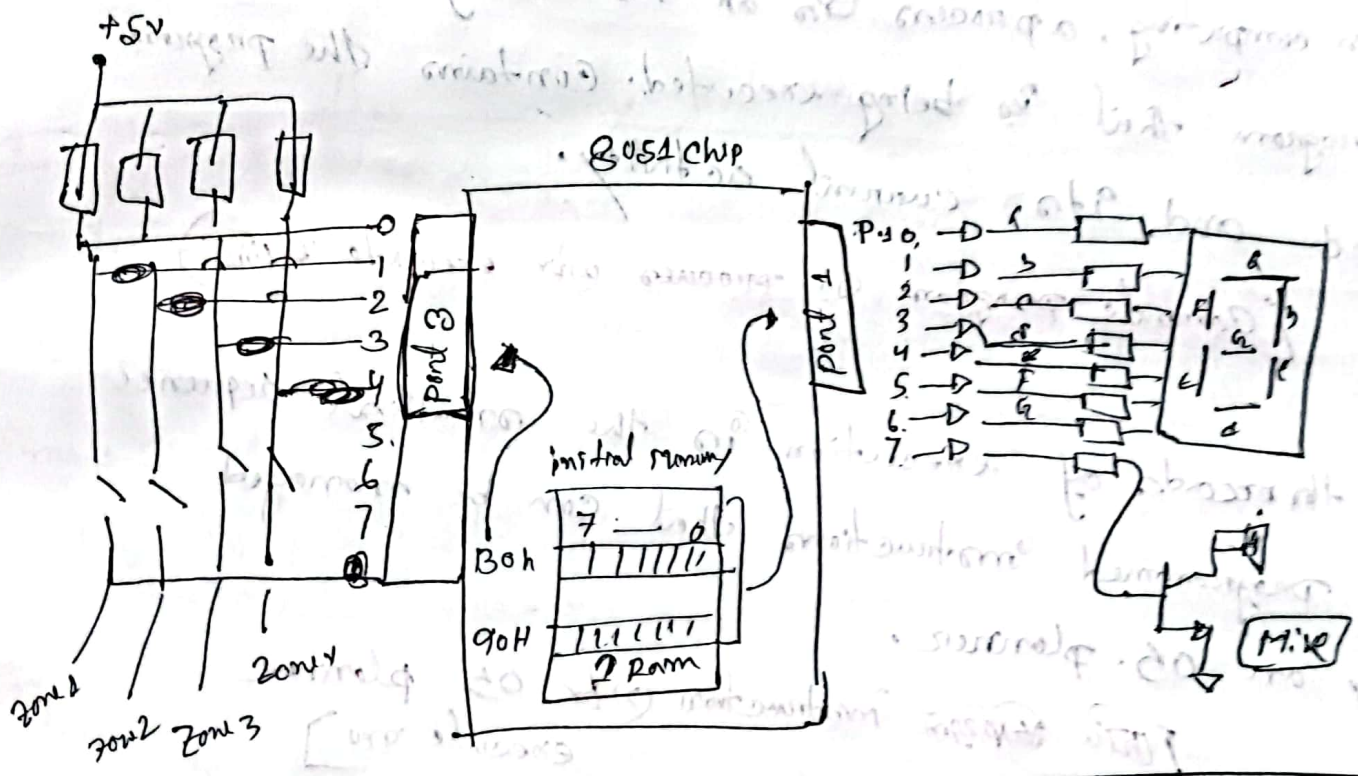- 8 bit register • flag register. It gives status after every instruction execution in program.

- Its bit addressable register.

④ 8051 Mc with 7 seg Display (componlar)

Qu: Multiple zone Alarm टाएगा.

flowchart. code,
Diagram

+5v

8051 chip

Port 3

Port 1

internal memory

| 7 — 0 |
| 80H | 1 1 1 1 1 1 1 |
| 90H | 1 1 1 1 1 1 1 |
| ? Ram |

P.1 0,
1
2
3
4
5
6
7

a
b
c
d
e
f
g

Mix

Zone 1
Zone 2 Zone 3
Zone 4

#

Initialise I/o ports
P1 & P3

read port 3
P3

Are all
P3 inputs 0
No

To
Zone 1
Active

Y/N

Display 1

Display 2

Dio 3

Dio 3

Display c

To
Zone 4
open

To Zone
3 act

To zone y
exe-fw

Sound bell

Addressing Modes of 8051.

#Immediate addressing Mode

• Data specified (512 byte) in instruction itself.

• " " by symbol before data in instruction.

Example : MOV A, #15H ; A ← 15H. { data @ द्वारा # चिन्ह द्वारा
        MOV DPTR, #1000H.

#Register Addressing Mode.

• Data is specified by register in instruction.

• The permitted are A, R7, R6, -- R0.

Example : MOV A, R2 || MOV R1, R2 — not allowed 8051.
        MOV R2, A ||

#Direct Addressing Mode;

• address of operand is given in instruction.

• only internal RAM & SFR allowed.

        00H→7FH   80H→FFH

Example : MOV A, 35H

        MOV 30H, 35H   # सीधा address

Indirect Addressing Mode :

- address of operand will be given by register

- Internal & External RAM accessed.

- Internal RAM with 8 bits.

ex: MOV A,@R1 , MOV @R2,A _____ @ इसका Indirect

- External RAM with 16 bits of addressing by.

DPTR "X" % used here.

Example : MOVX A,@DPTR

- MOVX @DPTR,A   x इसका DPTR @ external
                                                16 bit

Indexed Addressing Mode -

- used to access data from code memory (internal
                                                  & External RO

- In instruction use C to operate.

Example :

- MOVC A , @A+DPTR

MOVC A,@ A+PC

        C इसका Indexed