SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

Coimbatore-35

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

MICROPROCESSORS AND MICROCONTROLLERS

II YEAR/ IV SEMESTER

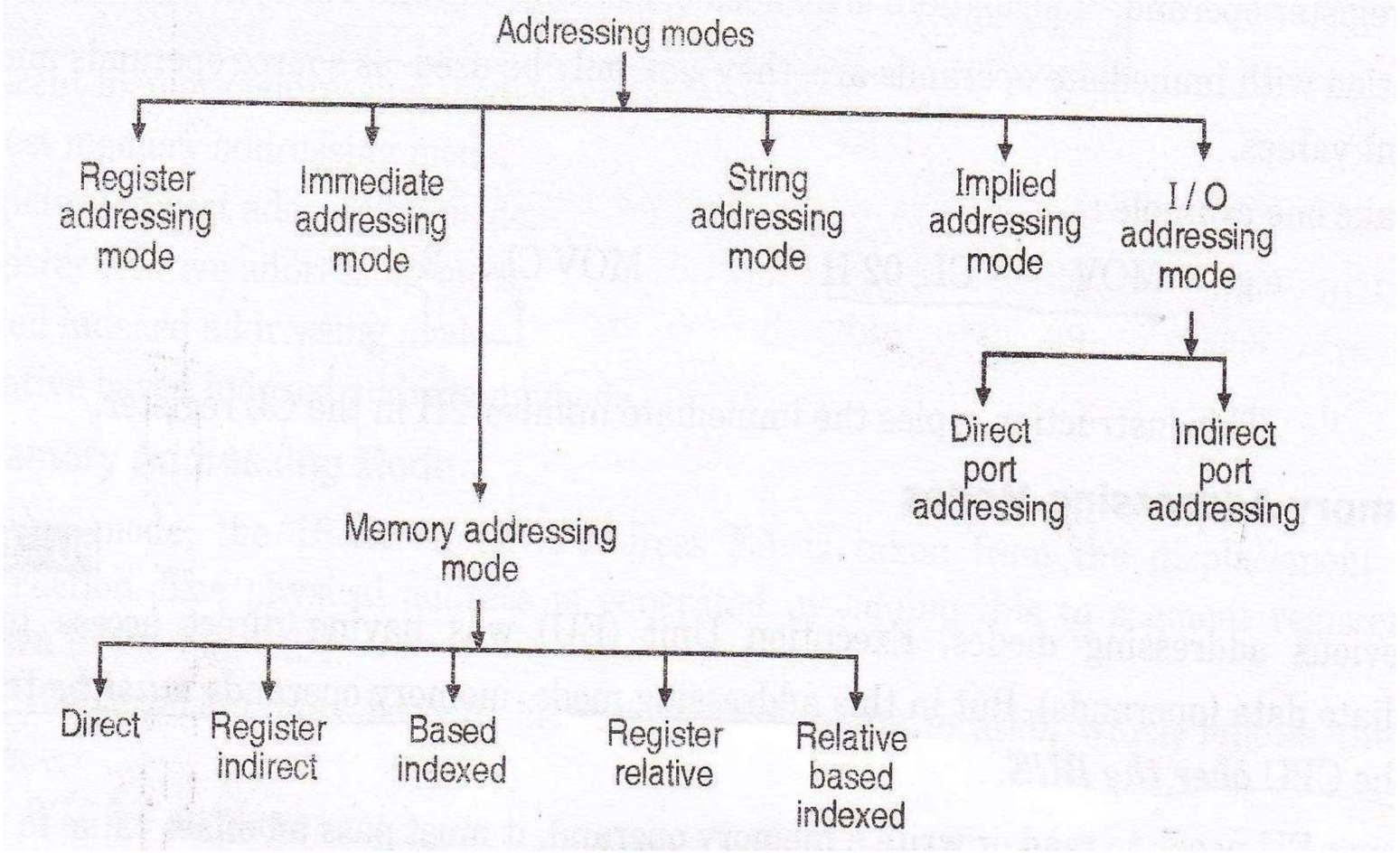
UNIT 1 – 8085 AND 8086 ARCHITECTURE

TOPIC – Addressing modes of 8086

ADDRESSING MODES OF 8086

1. Register Addressing Mode
2. Immediate Addressing Mode
3. Memory Addressing Mode
4. String Addressing Mode
5. I/ OAddressing Mode
6. Implied Addressing Mode

ADDRESSING MODES OF 8086



ADDRESSING MODES OF 8086

- Data is in register and Instruction Specifies the perticular register
- E.g

```
MOV AX,BX
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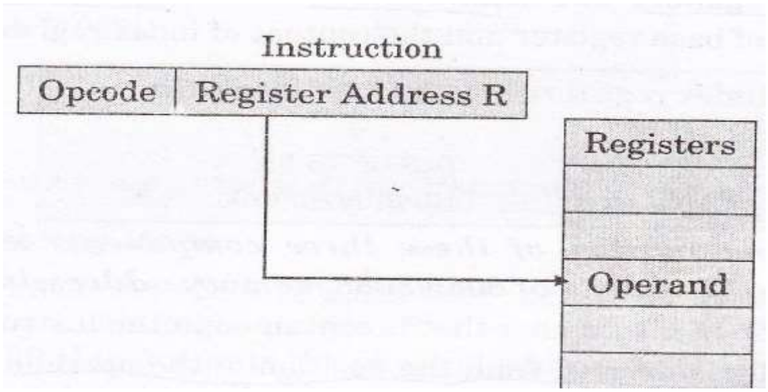
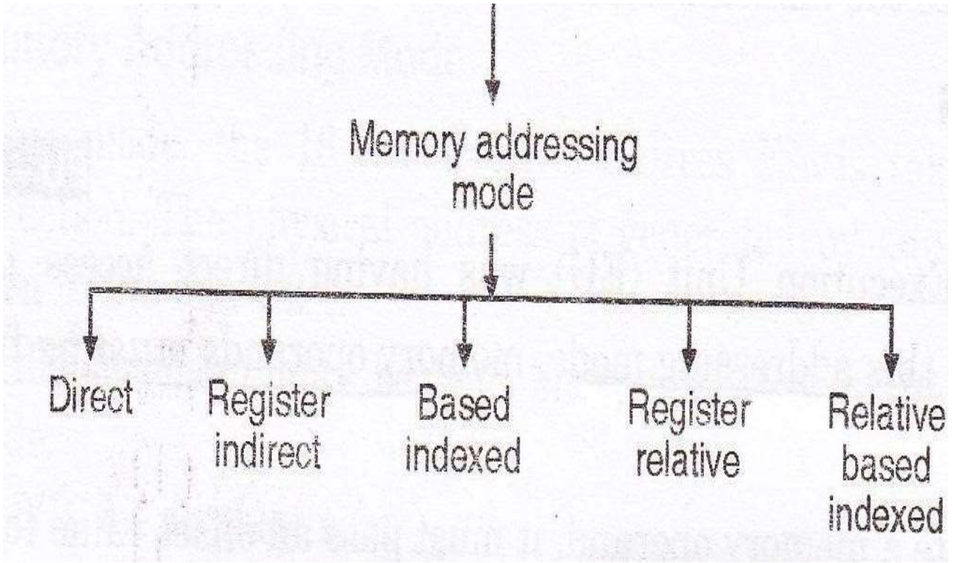


IMMEDIATE ADDRESSING MODE

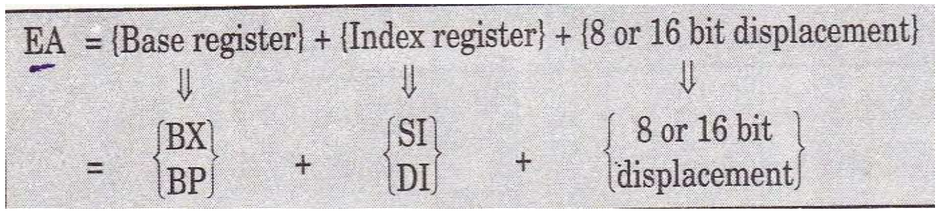
- Immediate operand is *Constant* data contained in an *Instruction*
- *i.e.* The source operand is a part of instruction instade of register memory
- E.g

MOV CL,02H



EFFECTIVE ADDRESS

- The *offset of a memory operand* is called the operand's effective address (EA).
- Is an *unsiged 16 bit no* . That expresses the *operands distance* in byte from the *begining of the segment*
- 8086 has Base register and Index register
- So EU calculates EA by summing a *Displacement, Content of Base register and Content of Index register* .

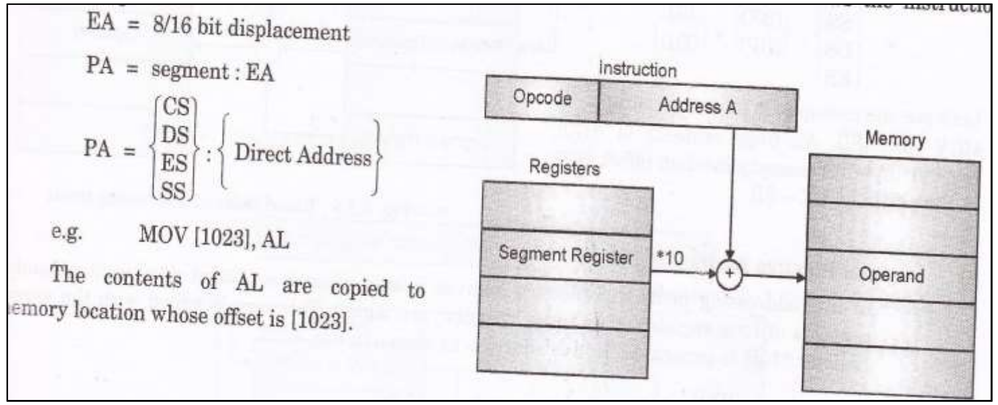


INSTRUCTION SET OF 8085

EA is taken from the *displacement field* of instruction.

PA=This addr. Is added with Seg.Regi*10H

MOV[1023],AL



REGISTER INDIRECT ADDRESSING MODE

EAof may be taken directly from *one of the base register or index register* .

PA=This addr. Is added with Seg.Regi*10H

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MOV[SI],AL
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$$EA = \begin{Bmatrix} (BX) \\ (BP) \\ (SI) \\ (DI) \end{Bmatrix} \quad PA = Segment : EA$$

$$PA = \begin{Bmatrix} CS \\ DS \\ SS \\ ES \end{Bmatrix} : \begin{Bmatrix} BX \\ BP \\ SI \\ DI \end{Bmatrix}$$

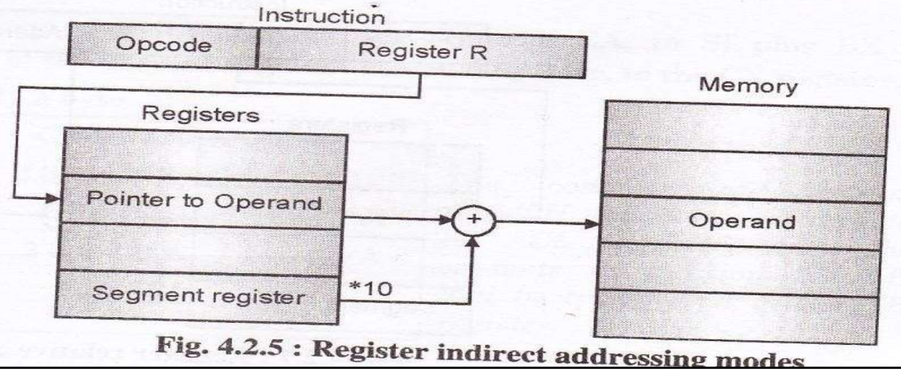

Fig. 4.2.5 : Register indirect addressing modes

BASED INDEXED ADDRESSING MODE

3) Based Indexed Addressing Mode

- In this addressing mode, the EA is sum of a base register and an index register, both of which are specified by the instruction. The sum is added to the segment register * 10 H to give effective address as shown in Fig. 4.2.6.

$$\therefore EA = \{\text{Base register}\} + \{\text{Index register}\}$$

$$= \begin{Bmatrix}(BX)\\(BP)\end{Bmatrix} + \begin{Bmatrix}(SI)\\(DI)\end{Bmatrix}$$

$$PA = \text{Segment register} : EA$$

$$= \begin{Bmatrix}CS\\SS\\DS\\ES\end{Bmatrix} : \begin{Bmatrix}(BX)\\(BP)\end{Bmatrix} + \begin{Bmatrix}(SI)\\(DI)\end{Bmatrix}$$

Let's see one example, to clear the concept.
MOV [BX] [SI], AL Copy contents of AL register (byte) to memory location offset is in [BX] [SI] i.e. [BX + SI].

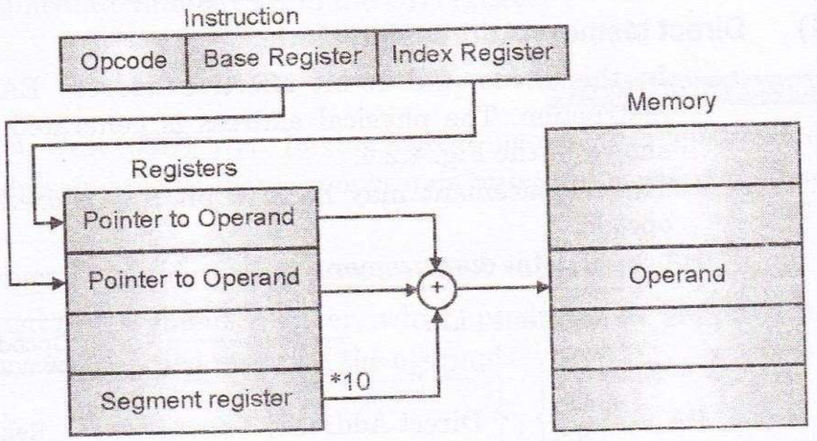

Fig. 4.2.6 : Based indexed addressing mode

REGISTER INDIRECT ADDRESSING MODE

$$EA = \begin{Bmatrix} (BX) \\ (BP) \\ (SI) \\ (DI) \end{Bmatrix} \quad PA = Segment : EA$$

$$PA = \begin{Bmatrix} CS \\ DS \\ SS \\ ES \end{Bmatrix} : \begin{Bmatrix} BX \\ BP \\ SI \\ DI \end{Bmatrix}$$

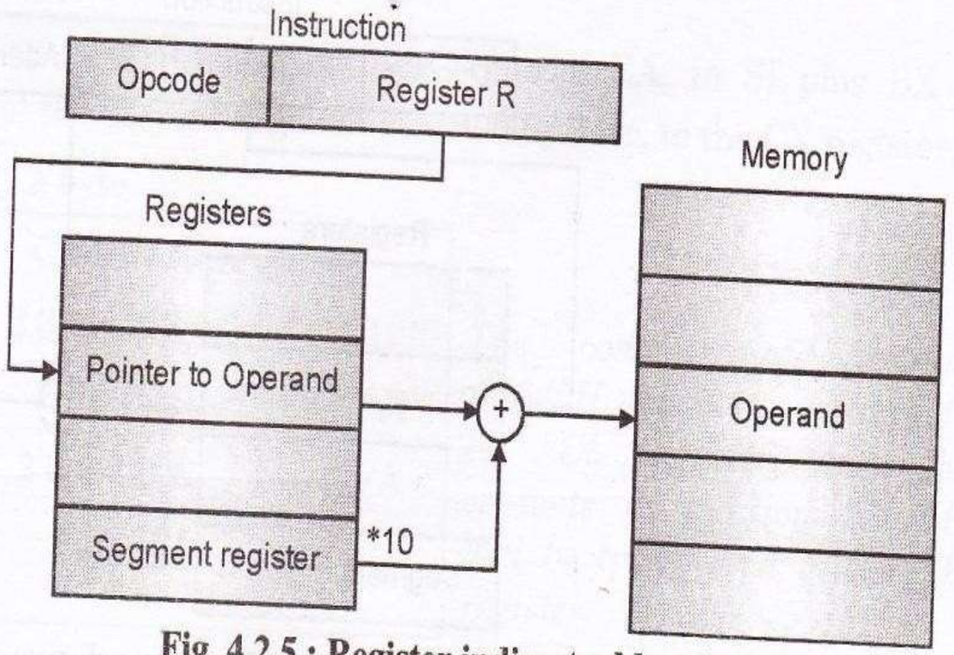

Fig. 4.2.5 : Register indirect addressing modes

THANK YOU