

## Lab Assignment Sheet 1

### Exercise 1

- Provide the effective address for the following segments:displacements:
  - DS:displacement = 4345h:0120h** Where does the data segment start and end?
  - CS:IP = 45A1h:0340h** Where does the code segment start and end?
  - SS:BP = F100h:0450h** Where does the stack segment start and end?
- If the physical address in main memory for a 16-bit word is **0xABCD0h**, provide some possible configurations for **segments:displacements**.
- Calculate virtual (segmented) addresses from the following effective address (provide 4 examples):

|        |                                                                                                                                                                                |                                                                                                                                                                                |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FB9ACh | E <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h | E <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h |
|        | <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h: C <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h | <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h: E <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> h |

- Recall the addressing modes of the 8086 and provide examples.
- Determine if the following instructions are correct:

|                    |                        |                  |
|--------------------|------------------------|------------------|
| MOV IP, 100h       | MOV CX, [100]          | MOV AH, 1345h    |
| MOV [SI], 5h       | MOV [BX+1], AX         | MOV BX, 0xABCD   |
| MOV [100], [BP]    | MOV ES, DS             | MOV [123], [456] |
| MOV DX, AL         | MOV [SP], 134h         | DIV AX, DX       |
| INC [BX]           | ADD [SI], 5            | MOV CS, AX       |
| MOV 200, AH        | MOV CX, [CX]           | MOV DS, AL       |
| PUSH 12h           | PUSH DS                | POP BL           |
| MOV b.[100], 1456h | MOV ES, 0ABCDh         | PUSH b.[SI]      |
| LEA BP, [BX+DI]    | MOV BP, OFFSET [BX+DI] | LEA BL, [10h]    |
| MOV DS, [65635]    |                        |                  |

- Assuming that the memory byte at **DS:555h** contains **12h** and at **DS:556h** contains **34h**, provide the content of the **AX** register after executing the instruction: **MOV AX, [555h]**.
- Assuming that the content of **BX** is a 2-byte value = 5678h, provide the content of the memory address **DS:400h** and **DS:401h** after executing the instruction: **MOV [400h], BX**.

### Lab Assignment Sheet 1-bis

#### Exercise 1

Assuming the registers have the following values (in Hex):

CS=8791h, DS=2000h, SS=3000h, SI=4000h, DI=5000h, FLAGS=0ED7h

SP=0FFFEh, BP=7000h, AX=25FFh, BX=6080h, CX=10FFh, DX=1299h.

Calculate the physical memory address where the source operand is stored, as well as the contents of the memory locations in each of the following instructions (**the instructions are dependent**):

- a. MOV [SI], AL
- b. MOV [SI]+BX+8, AH
- c. MOV [DI+6], BX
- d. MOV [DI][BX]+28h, CX
- e. MOV [BP][SI]+10h, DX
- f. MOV SS:[BX]28, AX
- g. MOV [3600h], AX
- h. ADD w.SS:[SI]+7010h, 77h
- i. INC b.[0B0A8h]
- j. PUSH BX

| Instruction | Operand Physical @ | Contents at @ |
|-------------|--------------------|---------------|
| a.          |                    |               |
| b.          |                    |               |
| c.          |                    |               |
| d.          |                    |               |
| e.          |                    |               |
| f.          |                    |               |
| g.          |                    |               |
| h.          |                    |               |
| i.          |                    |               |
| j.          |                    |               |

#### Exercise 2

Provide the state of the **O**, **S**, **Z**, **A**, **P**, and **C** flags in the flag register after the execution of the following **8-bit** operations:

- Op1. 26h+5Ah
- Op2. B5h+4Ah
- Op3. B0h+BCh
- Op4. F0h+10h
- Op5. 50h+60h
- Op6. D5h-F3h
- Op7. 76h-CEh
- Op8. F4h-7bh

| Operation | O | S | Z | A | P | C |
|-----------|---|---|---|---|---|---|
| Op1.      |   |   |   |   |   |   |
| Op2.      |   |   |   |   |   |   |
| Op3.      |   |   |   |   |   |   |
| Op4.      |   |   |   |   |   |   |
| Op5.      |   |   |   |   |   |   |
| Op6.      |   |   |   |   |   |   |
| Op7.      |   |   |   |   |   |   |
| Op8.      |   |   |   |   |   |   |