

# Assignment 4

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## Section 1

Question 1:

1. List the 3 operands types. (1 point)

• Immediate	• Register	• Memory
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2. What are the four essential status flags? (2 points)

• Sign Flag	• Zero Flag
• Carry Flag	• Overflow Flag

3. All two-operand instructions are in the form: OpCode Destination, Source (1 point)
- True
4. How can we scale an indirect or indexed operand to the offset of an array element? (2 points)
- We can scale an indirect by multiplying the index by the array's type.
5. What are the two situations in which the overflow flag is set? (2 points)
- Overflow flag will be set when the signed result of an operation is invalid
  - Overflow flag will be set the signed result of an operation is out of range
6. What does the LENGTHOF operator do: (2 points)
- The LENGTHOF operator returns the number of elements in an array.

Question 2:

1. What will be the value in EDX after each of the lines marked (a) and (b) execute? (4 points)

```
.data
one WORD 8002h
two WORD 4321h
.code
mov edx,21348041h
movsx edx,one ; (a)
movsx edx,two ; (b)
a. EDX = FFFF8002
b. EDX = 00004321
```

2. What will be the value of the Parity flag after the following lines execute? (2 points)

```
mov al,1
add al,3
a. PF = 1
b. PF = 0
```

3. Explain briefly one difference between direct and indirect addressing. (5 points)

Direct Addressing	Indirect Addressing
<ul style="list-style-type: none"><li>Provides the full address of the main memory in the instruction where the address is stored.</li></ul>	<ul style="list-style-type: none"><li>The address is stored at the address field of the instruction.</li></ul>
<ul style="list-style-type: none"><li>One memory reference required in the direct mode.</li></ul>	<ul style="list-style-type: none"><li>Two memory reference require in the indirect mode.</li></ul>
<ul style="list-style-type: none"><li>While executing the instruction, the supplementary calculation is not required.</li></ul>	<ul style="list-style-type: none"><li>While executing the instruction, more computations are required.</li></ul>
<ul style="list-style-type: none"><li>Is faster than indirect addressing</li></ul>	<ul style="list-style-type: none"><li>Is slower than direct addressing</li></ul>

4. Explain why each of the following MOV statements are invalid: (5 points)

```
.data
bVal BYTE 100b
Val2 BYTE ?
wVal WORD 2
dVal DWORD 5
.code
mov ds,45 ; Immediately moves to DS are not permitted
mov ah,wVal ; Size mismatched
mov eip,dVal ; eip can never be a destination in the mov
mov 25,bVal ; immediate value can never be a destination in the mov
mov bVal2,bVal ; Memory to memory mov is not permitted
```

5. What are the four main tasks of the LABEL Directive? (4 points)
- a. Gives an alternative size attribute to an existing storage location
  - b. Gives an alternative name to an existing storage location
  - c. Does not allow any storage
  - d. Removes the need for the PTR operator