



**National University**

**of Computer & Emerging Sciences Peshawar Campus**

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Roll No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examination: Sessional-1

Total Marks: 50 Weightage:15

Date: October 23rd, 2021

Instructor: Ms Safia Fatima ­­­

Program: ­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (BCS-3 ABCD)

Semester: Fall-2021

Time Allowed: 1 hour

Course:EE2003 Computer Organization & Assembly Language

**NOTE:** Attempt all questions.

**NO ANSWER SHEET REQUIRED**

**Question No. 1**

1. Consider CPU have done its computation and wants to write the result on RAM. Explain how this can be achieved? [Marks: 3]

|  |
| --- |
|  |

1. What are caches? What is the purpose of it? The architecture we have discussed in class “Intel Core i7 Processor”, had multiple caches, why? [Marks: 3]

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|  |

1. What is a flag? What is its purpose? Give an example of sign and overflow flag. Which instruction affects them? Name any two. [Marks: 3]
2. Differentiate between a physical address and a logical address? How a physical address is computed? Explain your answer with an example and a diagram. Do mention the assumed values of CS and DS registers.

[Marks: 5]

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**Question 2**

1. Consider the following data in RAM (intel architecture). After the execution of the instruction, what will be the value in AX register? Justify your answer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 011C |  |  |  |  |
| … |  |  |  |  |
| … | 86 | 89 | A3 | BB |
| … | B6 | 00 | 43 | 54 |
| 010D | 0A | 00 | 30 | 45 |
| 0108 | BB | 14 | 02 | FA |
| 0104 | 05 | 00 | 1E | 00 |
| 0100 | B8 | 0A | 00 | 90 |

mov ax, 10

|  |
| --- |
| AX= |

[Marks: 2]

|  |
| --- |
| Justification: |

mov ax, [num1] Assume num1 is referring to address 0104

|  |
| --- |
| AX= |

[Marks: 2]

Justification:

mov ah, [num1+2]

|  |
| --- |
| AX= |

[Marks: 2]

Justification:

1. Consider the following data for the next several questions:

Val1: dw 5

va12: dw 8

val3: dw 10

va14: dw 15

1. Write an instruction that increments val1. [Marks: 2]
2. Write an instruction that subtracts val3 from ax. [Marks: 2]
3. Write one or more instructions that subtract val4 from val2. [Marks: 3]
4. If val2 is incremented by 1 using the ADD instruction, and then compared with val3, what will be the values of the Carry, Sign flags and Zero flag? [Marks: 3]

1. Implement the following expression in assembly language: AX = (-val2 + BX) - va14. [Marks: 4]

**Question 3:**

1. Consider the following data 5, 10, 8, 6, 11, 20. Use a loop to iterate over all the data and if the values are less than 12 then add the values in the variable named “less” else add the values in the variable named “greater”. You are required to write assembly language code for this. [Marks: 10]

b. Convert the following code in assembly language [Marks: 6]

a=0

b=200

c=30

while (a! =b)

{

if(a<100)

{

a=c+10

}

elseif (a==100)

{

break;

}

else

{

a+=10

}

}

**Rough Work**