

 **COMSATS University Islamabad, Lahore** **Campus**

**Quiz 1– SPRING 2020**

**SOLUTION**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Title: | | Microprocessor and Assembly Language | | | | | | | Course Code: | | CSC321 | Credit Hours: | | 3 (2,1) |
| Course Instructor/s: | | Sheeza Zaheer | | | | | | | Programme Name: | | BCS | | | |
| Semester: | | 6 | | Batch: | | FA17 | Section: | | B | | Date: |  | | |
|  | |  | | | | | | | **Maximum Marks:** | | | **15** | | |
| Student’s Name: | |  | | | | | | | Reg. No. |  | | | | |
| **Important Instructions / Guidelines:**   * Be precise and to the point while answering any question. * Cheating will result in negative marking. | | | | | | | | | | | | | | |
| **Q1** | **Q2** | | **Q3** | | **Total** | | |  | | | | |
|  |  | |  | |  | | |  | | | | |

**Question 01:** Perform following subtraction by two’s complement addition: [**Marks: 5**]

DBD1h – 5AA1h

**Answer:**

5AA1h: 0101101010100001

1’s complement: 1010010101011110

2’s complement: 1010010101011111

DBD1h: 1101101111010001

Addition: 1000000100110000

DBD1h-5AA1h: 8130h

**Question 02:** [**Marks: 5**]

Show how the decimal number -112 will be represented as 8-bit and 16-bit binary number?

**Solution:**

|  |  |
| --- | --- |
| 2 | 112 |
| 2 | 56 - 0 |
| 2 | 28 - 0 |
| 2 | 14 - 0 |
| 2 | 7 - 0 |
| 2 | 3 - 1 |
|  | 1 - 1 |

112 = 0111 0000b

Taking 2’s compliment: 1000 1111 + 1 = **1001 0000b** (8-bit) (Credit: 3.5)

In 16-bit: **1111 1111** **1001 0000b** (Credit: 1.5)

**Question 3:** Using only MOV, ADD, SUB, INC, DEC, XCHG instructions to translate the given statement into assembly language. Assume A, B and C are word variables:

C = 2 \* A + B -2 [**Marks: 5**]

**Answer:**

MOV AX, A

ADD AX, A

ADD AX, B

SUB AX, 2

MOV C, AX