## Quiz 1 (Fall 2022) - Solution

**Course Name: Computer Organization**                    **Time: 20 mins**

**Instructor: Dr. Ayaz ul Hassan Khan**

Name: _____     Identification #: _____

Date: _____  Total Marks: _____10_____  Marks Obtained: _____

Signature of Instructor: _____

Q#1: Consider the machine instruction code: 0x01CC2820 and answer the following questions.                                                      **[5 marks]**

| | | | | | |
|---|---|---|---|---|---|
| 0000 0001 1100 1100 0010 1000 0010 0000 | | | | | |
| 000000 | 01110 | 01100 | 00101 | 00000 | 100000 |
| 0000 0000 | 0000 1110 | 0000 1100 | 0000 0101 | 0000 0000 | 0010 0000 |
| 0x00 (0) | 0x0E (14) | 0x0C (12) | 0x05 (5) | 0x00 (0) | 0x20 (32) |
| add $a1, $t6, $t4 | | | | | |

| Question | Answer |
|---|---|
| A. What is the type of this instruction? | R-Type |
| B. Which assembly instruction (mnemonic) this instruction refers to? | add |
| C. What is the name of the register used as 'rd' in this instruction? | $a1 |
| D. What is the name of the register used as 'rs' in this instruction? | $t6 |
| E. What is the name of the register used as 'rt' in this instruction? | $t4 |

Q#2: Complete the symbol table for the following data definitions showing the address of each label, given the starting address is **0x10010000** in the data segment.   **[5 marks]**

```
.DATA
    var1:   .BYTE    1, 2, -3, 5, 6, 7
    var2:   .WORD    0x12345678:10
    str1:   .ASCIIZ  "My String\n"
    .ALIGN  3
    var3:   .HALF    1000
    var4:   .DOUBLE  1.5e-10
```

| Label | Address |
|---|---|
| var1 | 0x10010000 |

| var2 | 0x10010008 |
| --- | --- |
| str1 | 0x10010030 |
| var3 | 0x10010040 |
| var4 | 0x10010048 |