Capital University of Science and Technology

Department of Computer Science

CS 2523 – Computer Organization and Assembly Language

QUIZ NO. 6: Assembly Language

CLO: 3. Implement assembly programs of intermediate complexity using the intel 8088 architecture. The student should also be able to convert intermediate complexity program in high level language into assembly code. [C3- Applying]

Semester: Summer 22 **Max Marks:** 10

Instructor: Ms. Tayyaba Zaheer **Date:** September 14, 2022 **Max Time:** 15 Minutes

Name: **Reg. No.**

Question No.1 [04 Marks]

Please choose the correct option:

i. There is no difference between shr and sar in terms of "Shifting right means dividing the number by 2":
   a) False
   b) True
   c) Depends on the number under consideration
   d) Depends on the most significant bit

Solution: b

ii. Shift arithmetic right of -68 would result into:
   a) 136
   b) -136
   c) 34
   d) -34

Solution: d - SAR: Shift Arithmetic Right divides the signed number by 2.

iii. Identify the jump: Machine code of the instruction is EB06H
   a) Conditional Jump
   b) Unconditional Jump
   c) Can be both a and b
   d) None of the mentioned

Solution: c – Short Jump. One byte is of code and one byte is of displacement.

iv. After the execution of the given code, what would be the values of the registers?

```
[org 0x100]
mov ax, 2
mov bx, 1
sub ax, bx
add ax, bx
add ax, bx
mov ax, 4
mov cx, 4
mov ax, 0x4c00
```

a) Ax=4C00, Bx=1 and Cx=4
b) Ax=4, Bx=1 and Cx=4
c) Ax=4, Bx=1 and Cx=4C00
d) Ax=4C00, Bx=4 and Cx=1

Solution: a

Question No.2 [03 Marks]

Suppose AL contains 10011000_b and CF= 0. Give the new contents of AL and CF (Carry Flag) after the following instructions are executed.

SHL AL, 1
RCR AL, CL; if CL contains 2

Solution:

AL = 00110000 CF = 1
AL = 10011000 CF = 0
AL = 01001100 CF = 0

Question No.3 [03 Marks]

List down the names of all types of Address Wraparounds. Explain Address Wraparound Within a Single Segment with an example.

Solution:

2 Types of wraparounds.

1. **Address Wraparound Within a Single Segment:**
2. **Address Wraparound inside the whole physical memory**

Address Wraparound Within a Single Segment:

- Segment wraparound occurs when during the effective address calculation a carry is generated.
- This carry is dropped giving the effect that when we try to access beyond the segment limit, we are actually wraparound to the first cell in the segment.
- For example if BX=9100, DS=1500 and the access is [bx+0x7000] we form the effective address 9100 + 7000 = 10100.
- The carry generated is dropped forming the actual effective address of 0100.
- Just like a circle when we reached the end we started again from the beginning.
- An arc at 370 degrees is the same as an arc at 10 degrees.
- We tried to cross the segment boundary and it pushed us back to the start.
- This is called segment wraparound. The physical address in the above example will be 15100.