University of Asia Pacific

Department of Computer Science & Engineering

Mid-Semester Examination Spring-2020

Program: B. Sc. Engineering (3rd Year/ 1st Semester)

Course Title: Microprocessors & Assembly Language. Course No. CSE 311 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

There are **Four** Questions. **Answer three questions including Q-1 and Q-2.**

1. a. Suppose, you have 3 best friends named A, B, and C. **[14]**

CS = (Last 4 digit of your student id)H,
IP = (Last 4 digit of your best friend A's student id) H.
SS = (Last 4 digit of your best friend B's student id) H,
SP = (Last 4 digit of your best friend C's student id) H.

Now, find out the physical address of the first instruction to be executed and the first location of the Stack to be used to execute the code.

b. With an example, prove that the logical address of a memory location is not unique. **[6]**

2. a. "A processor is N-bit" - what does it imply? From address bus, data bus and size of ALU, and registers, which effects the processor length? Shortly describe BIU. **[10]**

b. Write a short note on the following (answer any 2). **[10]**

i. EU
ii. Stack
iii. ALU
iv. Status Register

3. a. ADD AX, BX. Where, AX = (Last 4 digit of your student id)H, BX = FFFF H. How the aforementioned instruction will affect CF, PF, ZF, SF, OF Flags. **[10]**

b. Using Only MOV, ADD, SUB, INC, DEC translate the following high-level language assignment statements into assembly language. A, B, and C are word variables. **[10]**

1. C = constant1 * A + constant2 * B + constant3
2. C = 2*(constant1 * A + constant2 * B + constant3 * C)

Where, constant1 = (Student ID) mod 3 + 1
constant2 = (Student ID+1) mod 3 + 1
constant3 = (Student ID+2) mod 3 + 1

[Note: for Student ID = 12101022,
Constant1 = (12101022) mod 3 + 1 = 0 +1 = 1

Constant2 = (12101022+1) mod 3 + 1 = 1 +1 = 2
Constant1 = (12101022+2) mod 3 + 1 = 2 +1 = 3]

OR

4. a. Compare based and indexed addressing modes. **[6]**

b. Find out the addressing modes of the following instructions: **[4]**

i. MOV AX, A[BP+SI]

ii. MOV AX, A[BX][DI]

iii. MOV AX, D

c. Consider the following instructions and mention register used by these(answer any 4): **[10]**

i. MUL

ii. OUT

iii. LOOP

iv. PUSH

v. INT 21H(for single character input)

vi. INT 21H(for single character output)

vii. INT 21H(for string output)