Daffodil International University

Department of Computer Science and Engineering

Faculty of Science and Information Technology

Semester Final Examination, Semester: Fall 2019

Course Code: CSE 231 **Course Title: Microprocessor and Assembly Language**

Time: 2 Hours **Total Marks: 40**

Life will give you many options, but today you have "Answer all the questions"

Answer all part of each questions sequentially

1. a) **TRUE/FALSE**: Just write TRUE or False for the following statements. [5]
   (i) JNB is an example of conditional jump instruction.
   (ii) REPEAT loop is likely to be a little shorter because there is only a conditional jump at the end, but a WHILE loop has two jumps: a conditional at the top and a JMP at the bottom.
   (iii) After execution of any logical instruction (e.g. AND, OR, XOR), the result outcomes a zero in SF and OF.
   (iv) XOR AX, AX (suppose, AX = 11001100b), can be used to clear the register AX.
   (v) The full form of LEA is "Load Effective Access".

   b) **Output Tracing**: Assume the initial Model, Stack, Data segment and Headers are written. [5]
   Write down the contents of registers after execution of the codes (if nothing comes in the console).

   (i)
   ```
   MOV AL, 1h
   MOV BL, 3h
   CALL m2
   CALL m2
   CALL m2
   CALL m2
   RET
   m2 PROC
   MUL BL
   RET
   m2 ENDP
   END
   ```

   (ii)
   ```
   L1:
   MOV AX, 6h
   CMP AX, 0
   JGE L2
   JMP EOF
   L2:
   MOV AX, 3h
   Print 'DIU'
   JMP L1
   EOF:
   END
   ```

2. a) Write short note on: [4]
   (i) **NMI** and
   (ii) **HLDA**

   b) Briefly analyze and describe the basic process of direct memory access. (Use diagrams if needed) [6]

3. a) Write down the assembly instructions to execute the following statements. [4]
   (i) Multiply AL register by 16 using shifting instructions.
   (ii) Complement the MSB of DX, leaving the other bits unchanged.
   (iii) Clear the 3rd, 5th and 7th bit of AX register, leaving the other bits unchanged.
   (iv) Set the MSB & LSB of BL register, leaving the other bits unchanged.

b) Suppose DL contains 3Ah, CL contains 03h and CF contains 1. Determine the contents of DL and CF after each of the following instructions is executed. Assume the instructions are executed sequentially. [6]

(i) **SHL DL, 1**
(ii) **ROR DL, CL**
(iii) **RCL DL, 2**

4. a) Explain the functionality of PUSH and POPF instructions briefly. [2]

b) Translate the following high-level language statements into equivalent assembly language instructions. [3]

B = (A - B) X (B / 8)

c) Write a sequence of assembly instructions to do the following task. [5]

Put the summation of 1 +4 +7 + …..+148 in DX.

-- Best of Luck ☺ --

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