Library

B.Sc. Engg. / HD CSE 5th Semester — 27 February 2020 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION — **WINTER SEMESTER, 2019-2020**

DURATION: 1 Hour 30 Minutes — **FULL MARKS: 75**

CSE 4503: Microprocessors and Assembly Language

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

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1. a) Derive the contents of the `Flag` (`CF, PF, ZF, SF, AF`) register of `8086` microprocessor upon executing the following instructions: 10

   i. `CMP AL, ABh` ; Assume `AL` initially contains `ABh`.
   ii. `ADD AX, 8000h` ; Assume `AX` initially contains `8000h`.

   b) Write appropriate assembly language codes for 8086 to accomplish the following tasks: 8

   i. 0Fh × (225 - 200) + 127
   ii. 0FFFh × 10h + 10101010b

   c) What is an assembler? Using an appropriate example, briefly explain the concept for fetching of an instruction/data from the memory. 2+5

2. a) Considering following memory addresses and instructions, mention the output (i.e., values) of register A, B and Stack Pointer (SP) after execution of all the instructions. Assume, initially the stack is empty. 10

Memory Address	Assembly Language
0100h	**MVI** A, 250
0102h	**MVI** B, 10
0104h	**ADD** B
0106h	**PUSH** A
0108h	**POP** B

   b) Briefly explain about the stack operation of 8086 microprocessor. 8

   c) Write an assembly language code to take a single-character as an *input* and show the same character as an *output* with new line and carriage return. 7

3. a) Derive the machine codes of the following `MOV` instructions using its coding template and also show how the machine codes of the instructions are to be stored in memory: 10

   i. `MOV AL, 255`
   ii. `MOV SS:[SI], DH`

   b) How do `8085` and `8088` microprocessors differ with each other in terms of flag register? 8

   c) Write an assembly language program structure to allocate exactly 64 Kbytes of memory for *code segment and data segment*, and also 1024 Bytes for *stack segment*. 7

4. a) Write an assembly language program equivalent of *if-else* using conditional jump instructions for accessing following conditional levels L1, L2 and L3; where, take two values at AL and BL, respectively. 10

Condition	Operations for Levels
`If AL>BL`	`L1: Add AL with BL`
`If AL<BL`	`L2: Subtract BL from AL`
`If AL=BL`	`L3: X-or between AL and BL`

b) Write short notes on Addressing Codes from memory 8

c) Explain the procedure to perform `SUB` and `CMP` operation in assembly language. 7