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

MID SEMESTER EXAMINATION   WINTER SEMESTER, 2017-2018
DURATION: 1 Hour 30 Minutes   FULL MARKS: 75

CSE 4573: Microprocessor and Assembly Language Programming

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) Briefly describe odd and even addressed byte and word transfer of 8086 with the help of odd   8
   and even address space and appropriate examples.

   b) Write an assembly language program that will prompt the user to give two numbers as input   10
   and display the summation of the numbers in the next line. Assume that the summation will
   not exceed 9.
   Sample Execution:
   ```
   Enter the first number: 2
   Enter the second number: 3
   Answer: 5
   ```

   c) What is memory model? Describe different types of memory models.   7

2. a) Draw the internal block diagram of an 8086 microprocessor and briefly explain different   15
   components of independent functional parts.

   b) How does a processor determine that overflow has occurred? Consider both signed and   7
   unsigned overflow. Explain with examples.

   c) What is the purpose of FLAGS register? Why is it beneficial for a microprocessor?   3

3. a) What is the main purpose of the LEA instruction? Why do we need to initialize the DS   5
   register at the beginning of a program for displaying a string?

   b) Draw a diagram to depict the read and write bus cycle executed sequentially by a   10
   microprocessor.

   c) Describe different types of addressing modes of 8086 microprocessor.   10

4. a) For each of the following instructions, give the new setting of CF, SF, ZF, PF, OF and   15
   briefly explain the reasons. Suppose that the flags are initially 0.
   i.   CMP BX, CX ;[BX=0009H, CX=00FFH]
   ii.   INC AX ;[AX=00FFH]
   iii.   NEG DX ;[DX=8000H]

   b) What are the functionalities of the following 8086 pins?   10
   $\overline{BHE}$, MN/$\overline{MX}$, ALE, $\overline{TEST}$, HOLD