B.Sc. Engg. /HD CSE 5th Semester (60) 23 February 2012 (Morning)

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

MID SEMESTER EXAMINATION **WINTER SEMESTER, 2011-2012**

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) Draw the internal block diagram of an Intel 8086 microprocessor and briefly explain the different components in Execution Unit — 12

   b) Suppose a memory Location has physical address at A90F2h. Compute the followings: — 8
      i. Offset address if segment number is A45Ch
      ii. Segment number if offset address is 1CB2h.

   c) What do you understand by control flag? Show the bit positions of different control flags of 8086 microprocessor. — 5

2. a) Describe the principle steps to create, assemble and run a program. What are the main tasks of Assembler and Linker? — 3+2+2

   b) What is the main purpose of LEA instructions? Which of the following names are legal in IBM PC assembly language? Provide justification for the ones you think are illegal. — 8
      i. total.
      ii. 3rd_Number
      iii. variable#
      iv. %155
      v. ._@
      vi. second Number

   c) Write an assembly language program to read an uppercase letter and display it on the next line in lower case. — 10
      Sample execution:
      ENTER A UPPER CASE LETTER: E
      IN LOWER CASE IT IS: e

3. a) How does the processor determine that Overflow has occurred? Consider both signed and unsigned Overflow. — 10

   b) For the following instruction, give the new destination content and the new setting of CF, SF, ZF, PF and OF. Suppose the flags are initially assigned to 0. — 7
      SUB AX, BX
      where AX contains 0000h and BX contains 8000h

   c) Write a code segment to Read a character and if it is an uppercase letter, display 'U'; otherwise terminate the program. — 8

4. a) Explain with example the Signed Conditional Jumps and Unsigned Conditional Jumps. 8

b) What will be the output of this code segment? 8

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MOV AH, 2
MOV CX, 6

AGAIN:

MOV DL, 55d   ; the ASCII code 55d = 7 (number seven)
MOV BX, CX
      TOP:
                  INT 21h
                  DEC DL
                  DEC BX
                  JNZ TOP
MOV DL, 0Dh
INT 21h
MOV DL, 0Ah
INT 21h
LOOP AGAIN
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c) Write a sequence of instructions to do the following: 9
Read a character and display it 50 times on the next line