Fourth Semester B.E. Degree Examination, June–July 2009
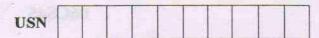## Microprocessors

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. With a neat diagram explain the architecture of 8086 microprocessor along with function of each block and register.   **(10 Marks)**

   b. How many address lines does an 8086 have?
      i)   How many memory addresses does this number of address lines allow the 8086 to access directly?
      ii) At any given time, the 8086 works with 4 segments in this address space. How many bytes are contained in each segment?
      iii) Describe the difference between the instructions
           MOV AX, 2347H   and   MOV AX, [2347H]   **(05 Marks)**

   c. Write 8086 assembly instruction which will perform the following operations:
      i)   Multiply AL times BL.
      ii) Load the number F3H into AL register.
      iii) Copy BP register contents to SP register.
      iv) Divide the AL register contents by 2 by using a shift instruction.
      v)   Multiply the AL register contents by 4 using shift instruction.   **(05 Marks)**

2 a. Write and explain instruction template for MOV instruction. Also generate opcode for following instructions: The opcode for MOV is ☐1☐0☐0☐0☐1☐0☐ ☐
      i)   MOV CL, [BX]
      ii) MOV CS, [BX], DL
      iii) MOV 43H [S1], DH
      iv) MOV CX, [437A]H   **(10 Marks)**

   b. What is an assembler directive? Explain the following assembler directive with example:
      i) PUBLIC   ii) PROC   iii) MACRO   iv) BB.   **(05 Marks)**

   c. Find and explain error if there are array in the following instructions:
      i) MOV AL, CX   ii) MVL BL, CX   iii) MOV Arr1[S1], Arr2[D1]
      iv) IN, 82H, AL   v) XCHG, AL, BL   **(05 Marks)**

3 a. Explain the 8086 conditional flags with each flag bits.   **(06 Marks)**

   b. Write an ALP to separate odd & even number in an array.   **(07 Marks)**

   c. Write an ALP to calculate delay of 100 ms for 8086 microprocessor working at 10 MHz clock. Assume and mention the states for each instruction used.   **(07 Marks)**

4 a. Differentiate between macros and procedures.   **(05 Marks)**

   b. Explain REP MOVSB instruction with example.   **(05 Marks)**

   c. Explain the sequence of operation that takes place when a procedure is called and returned from procedure base to calling program with block diagram.   **(10 Marks)**

PART - B

5 a. Explain the following instructions with an example:
i)   DAA
ii)   AAM
iii) LOOP
iv)   SUB
v)   XLAT   (10 Marks)

   b. Write an ALP to find subtracting is present or not in the main string.   (10 Marks)

6 a. Differentiate between memory mapped I/O and direct I/O.   (05 Marks)

   b. Write the timing diagram for a memory read machine cycle.   (05 Marks)

   c. With a neat diagram, explain the pin configuration of 8086.   (10 Marks)

7 a. Briefly explain the structure of 8086 interrupt response and interrupt vector table with a neat
       diagram.   (10 Marks)

   b. Explain with block diagram, the working of 8259 and also explain LCW's format. (10 Marks)

8 a. Explain the different methods of parallel data transfer with figure in a programmable
       peripheral interface.   (10 Marks)

   b. Explain with the internal block diagram of 8255, the different operational modes and the
       control word formats.   (10 Marks)

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