MCA (Revised)

Term-End Examination

June, 2007

MCS-012 (S) : COMPUTER ORGANISATION & ASSEMBLY LANGUAGE PROGRAMMING

Time : 3 hours   *Maximum Marks : 100*

(Weightage 75%)

Note :   *Question no. 1 is **compulsory** and carries 40 marks. Attempt any **three** questions from the rest.*

1. (a)   Convert the following :   8

      (i) $(32.6)_8$ to its decimal equivalent

      (ii) $(43.169)_{10}$ to its binary equivalent

      (iii) $(62.157)_{10}$ to its BCD equivalent

      (iv) $(ABC6)_{16}$ to its decimal equivalent

   (b)   Simplify the following boolean function using Karnaugh Map method :

      $F(A, B, C, D) = \Sigma(0, 1, 2, 4, 7, 9, 11, 14)$

      Also draw the logical circuit diagram for the result.   8

(c)   Write an assembly language program for 8086 microprocessor for interchanging the values of two memory locations. Also, explain the logic for the program written.   6

(d)   Design and draw a 4-bit parallel register using D-flip flops and explain its principle of working.   8

(e)   With reference to the instruction execution, explain how the following steps are performed and by which component :   10

   (i)   Calculate the address of the next instruction to be executed

   (ii)   Get the instruction into the CPU register

   (iii) Decode the instruction

   (iv)   Evaluate the operand's address

   (v)   Fetch the operand

2. (a)   Write an assembly language program for 8086 microprocessor to find the largest among the 3 numbers given.   10

(b)   Write a step-by-step process to explain how an interrupt is handled by a computer. How is interrupt handling different from subroutine handling ?   10

3. (a)   Write an assembly language program for 8086 microprocessor to convert a binary number to its equivalent BCD number and explain the logic of the program.   10

(b)   With the help of an example program, explain the concept of RISC pipelining.   10

4. (a) Draw the logic circuit for one stage of ALU with shift capability and explain its principle of working. *10*

(b) List various RAID levels, their category and their respective features. *10*

5. (a) Construct a full adder using half adders and explain its working. *5*

(b) Design a 4-bit shift left and right circuit using multiplexers. *5*

(c) Explain 4-way interleaved memory architecture with the help of diagram. *10*