MCA (Revised) / BCA (Revised)
Term-End Examination
December, 2014

□□□□

MCS-012 : COMPUTER ORGANISATION AND ASSEMBLY LANGUAGE PROGRAMMING

Time : 3 hours   *Maximum Marks : 100*

(Weightage 75%)

Note : Question number **1** is **compulsory** and carries
40 marks. Answer any **three** questions from the
rest.

1. (a) Represent $11 \cdot 0011 \times 2^{10}$ using the
         IEEE-754 standard for 32-bit floating point
         representation.   **6**

    (b) Perform the following operations :   **10**

         (i)   Convert Hex F15C to binary.

         (ii) Find the 2's complement
               representation of − 36 (8 bit).

         (iii) Add − 40 and 80 using 8 bit signed 2's
               complement representation.

         (iv) Convert decimal 65·75 to binary
               representation.

         (v)   Find the 1's complement of 10110 in
               8 bit representation.

(c) Explain the Wilkes control unit with the help of a diagram. **6**

(d) Calculate the physical address using the following 8086 registers : **4**

(i) SS = 6789 h

SP = 00FF h

(ii) CS = 4412 h

IP = 3900 h

(e) Explain any two uses of INT 21 h in 8086 assembly language. **4**

(f) List and explain various micro-operations for fetching an instruction (fetch cycle). **4**

(g) A memory has a capacity of 8 K × 8.

(i) How many data input and data output lines does it have ?

(ii) How many address lines does it have ?

(iii) What is the capacity in bytes ? **6**

2. (a) Explain the set associative cache mapping scheme with the help of an example. Make and state suitable assumptions. **8**

(b) Explain the following 8086 instructions : **6**

(i) AND

(ii) SHL

(iii) INC

(c) Explain the concept of Direct Memory Access with the help of a diagram. **6**

3. (a) What is an interrupt ? Explain the sequence of steps that occurs during interrupt processing. 8

(b) Explain the classification of printers. 6

(c) How are Call and Return instructions for a subroutine handled in a computer ? 6

4. (a) What is a multiplexer ? Explain how a 4×1 multiplexer can be designed using 2×1 multiplexers. 8

(b) What is an instruction pipelining ? What are the various problems that can occur while using an instruction pipeline ? 6

(c) Explain the following Addressing schemes : 6
(i) Indexed Addressing
(ii) Base Register Addressing
(iii) Relative Addressing

5. (a) Write the 8086 assembly language program to perform the following operation.

$$y = x * y,$$

where x and y may be assumed as memory locations. 6

(b) Explain the construction of an RS-flip-flop. 6

(c) Explain the following with the help of an example/diagram, if needed : 8
(i) Mask operation
(ii) DRAM
(iii) Access time on a hard disk
(iv) Parity bit