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MCS-012

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MCA (Revised)

Term-End Examination
June, 2010

MCS-012 : 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) How does the cache memory improve the overall processing speed of a computer system ? Explain. **5**

(b) Explain the differences between DRAM and SRAM. Draw a cell of SRAM. **5**

(c) What is an Interrupt ? What happens on the occurance of an interrupt ? **5**

(d) Simplify the following boolean function in SOP and POS forms by means of K-Maps. **5**

$F(A, B, C, D) = \Sigma (0, 2, 8, 9, 10, 11, 14, 15)$.

(e) A machine supports 30 operations and 12 addressing modes. The machine has 128 registers and the size of its main memory is 1 MB. Design a simple instruction format for the machine. You may assume that all the instructions in this machine have one register and one memory operand. 5

(f) Draw a block diagram to illustrate the operation of micro - programmed control unit. 5

(g) Explain the differences between FAR and NEAR procedures with the help of an example each. 5

(h) Write a program in 8086 assembly language that reverses a string stored in the data segment. 5

2. (a) Explain the working of JK flip flop with the help of suitable diagrams. Discuss its application in designing of a synchronous counter. 10

(b) Explain the following instructions of 8086 microprocessor with the help of an example each : 10

(i) XLAT (ii) DAS

(iii) CMPS (iv) ROL

3. (a) What are the various addressing schemes used for memory references ? Give an example of each. 9

(b) Can we store control and status information in the memory. Justify your answer. 3

(c) Represent 23.125_{10} as single and double precision IEEE 754 format/standard. 4

(d) Explain the functioning of a DMA controller with the help of a suitable diagram. 4

4. (a) What is a segment in 8086 microprocessor ? Can these segments overlap ? Explain. What are the default pointers to these segments ? 5

(b) Explain any two cache mapping schemes with the help of suitable diagrams. 8

(c) Write a 8086 assembly language program to implement the following nested loop : 7

```
for (i=1 to 10)
        {
        for (j=1 to 10)
          add 1 to Ax.
        }
```

5. Explain the following with the help of suitable example/diagram if needed. **20**

(a) Instruction cycle

(b) Quine Mckluskey method

(c) RISC and CISC Architecture

(d) Register Transfer Micro operations

(e) Liquid Crystal Displays (LCD^s)
