

**MCA (Revised)**  
**Term-End Examination**  
**June, 2008**

**MCS-012 : COMPUTER ORGANISATION &  
ASSEMBLY LANGUAGE PROGRAMMING**

Time : 3 hours

Maximum Marks : 100

(Weightage 75%)

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

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1. (a) Simplify the following boolean function in SOP form using K-Map :

$$F(A, B, C, D) = \Pi(0, 1, 2, 4, 6, 8, 9, 12, 14, 15).$$

Also, draw the simplified logic circuit diagram.

8

- (b) Assume a computer having 64 word RAM and cache memory of 8 blocks. Where can we find memory location 25 in cache when the following are used :

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- (i) direct mapping
- (ii) associative mapping
- (iii) 2-way set associative (2 blocks per set) mapping

Assume 1 word = 16 bits, block size = 32 bits.

- (c) What is the need of master-slave flip-flop ? Explain its functioning with the help of an example. 6
- (d) Show how the multiplication of floating point numbers is done with the help of an example. 5
- (e) In RAID levels, explain the features of those levels which have very good data transfer (read/write) rate. 5
- (f) Write an 8086 assembly language program that finds the smallest and the second smallest number from a list of 10 numbers stored in memory. 7
2. (a) Explain the process of handling an interrupt that occurs during program execution, with the help of an example. 9
- (b) Draw logic circuit for a converter that converts 4 bit binary input to its equivalent BCD number. 8
- (c) List three differences between Dynamic RAM and Static RAM. 3
3. (a) Explain briefly the working of two-pass assembler. 5
- (b) Give block diagram of DMA controller. How does the CPU initialize the DMA transfer ? 5
- (c) What is instruction pipelining ? Explain the working of instruction pipelining in RISC processor. 5
- (d) Draw the state table and the logic circuit for a 3-bit binary counter using D flip-flop. 5

4. (a) Design and discuss the working of a circuit capable of shifting the data left or right as desired. If no shifting is required the circuit should be able to refresh its present state. 8
- (b) Explain the operation of a micro programmed control unit with the help of a diagram. 8
- (c) Explain the working of DVD-ROM with the help of block diagram. 4
5. (a) What are the factors that should be considered while designing the length of an instruction ? 5
- (b) In the basic computer, can the two micro operations  $DR \leftarrow AC$ ,  $AC \leftarrow DR$  be executed simultaneously ? Justify your answer. 4
- (c) What is the significance of FAT ? What are the limitations of FAT 16 ? 4
- (d) Write a program in 8086 assembly language that accepts a character string, of maximum 10 characters, from the keyboard, converts each character of string to upper case and converts each character to the next character. i.e. A to B, B to C, and so on. Finally display the string on the screen. 7

