

MCA (Revised) / BCA (Revised)

Term-End Examination

June, 2015

14193

**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) IEEE floating point representation for single precision number uses the format as :

Sign bit (1 bit) Biased exponent (8 bits)
Significant (23 bits).

In this representation a floating point number where $0 < E < 255$ having any significant is equivalent to $\pm (1.N)_2 (E - 127)$. Using this format represent the following decimal numbers :

(i) 0.250

(ii) 8

Now using the representation perform the following operations : 10

(i) $0.250 + 8$

(ii) 0.250×8

(b) Simplify the following using Karnaugh's map : 6

$$F(A, B, C, D) = \sum(0, 1, 2, 4, 6, 8, 11, 12).$$

Draw the logic diagram for the resultant boolean expression using AND – OR – NOT gates.

(c) For a computer having 32 word RAM (1 word = 8 bits) and cache memory of 4 blocks (block size = 16 bits), where can we find main memory location 10 in cache if 6

(i) Associative mapping is used,

(ii) Direct mapping is used.

(d) Explain the following addressing modes with the help of an example each : 6

(i) Register Indirect Addressing

(ii) Stack Addressing

(iii) Indexed Addressing

(e) Explain any four characteristics of RISC machine. 4

(f) Write an Assembly language program to search a given number with value 25 in a group of 10 numbers stored in memory. Store 1 in AL register for successful search, else store 0. Make suitable assumptions. 8

2. (a) Explain the Instruction fetch with the help of micro-operations. 5
- (b) What is flash memory ? Explain how it is different from RAM. 5
- (c) Why do we need registers in a computer system ? Explain the importance of control and status register with the help of an example. 5
- (d) What is the purpose of segment registers in 8086 micro-processors ? Explain how code segment register can be used to calculate the address of the next instruction. 5
3. (a) Explain what is UNICODE. How is it different from ASCII ? 4
- (b) What is virtual memory ? Draw a block diagram for mapping a virtual address to a physical address. 5
- (c) Explain the programmed I/O with the help of a flow chart. 5
- (d) Explain the advantages and disadvantages of using Assembly language programming. 6
4. (a) What are Adders ? Explain half adders and full adders with logic diagram and truth tables. 6
- (b) What is DMA ? Draw and explain the block diagram of a DMA controller. 6

- (c) Draw the block diagram of the structure of a fixed point Arithmetic Logic Unit. 4
- (d) Write a program in Assembly language for interchanging the value of two memory locations. 4

5. Explain the following by giving one example or diagram for each : 5×4=20

- (a) D Flip-Flop
 - (b) The Interrupt Cycle
 - (c) Video Cards
 - (d) Far and Near Procedures
 - (e) CRT
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