

MCA (Revised)/BCA (Revised)**Term-End Examination****June, 2014****MCS-012 : COMPUTER ORGANIZATION AND
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) Add the following using 8 bit signed 2's complement representation : 6
- (i) 25 and -40
- (ii) 75 and 80
- (b) (i) How many error correcting bits are required to send an 8 bit data using SEC code ? 2+6=8
- (ii) If a 4 bit data 1010 is received as 1011, how this error, at bit position b1 can be detected ?
- (c) Simplify the following functions in Sum Of Product (SOP) form by using K-map. 5
- $F(A,B,C,D) = \Sigma(0,2,4,6,7,8,10).$

- (d) A computer supports a virtual memory of 1 Giga Byte and physical memory of 64 Mega Bytes. How many bits are needed to address the 4
- (i) virtual memory
 - (ii) physical memory
- (e) Consider two registers R1 and R2 having the following 4-bit binary values : 6
- R1 = 1100
R2 = 1010
- Perform the following operations on R1 using R2.
- (i) Selective set
 - (ii) Selective clear
 - (iii) Selective complement
 - (iv) Mask operation
- (f) Compare the following : 5
- (i) RAM Vs ROM
 - (ii) DRAM Vs SRAM
- (g) Write an 8086 Assembly Language Program to add 2 byte sized values stored in memory locations FIRST and SECOND, and store the result in location SUM. 6
2. (a) Differentiate the following : 8
- (i) Hardwired control unit Vs Micro-programmed control unit.
 - (ii) Unencoded micro-instructions Vs encoded micro-instructions.

- (b) A computer has a 64 word RAM (1 word = 16 bits) and a cache memory of 8 blocks (block size = 32 bits). Find the main memory word 25 in cache if : $4+4+4=12$
- (i) Direct mapping is used
 - (ii) Associative mapping is used
 - (iii) 2-way set associative (2 blocks per set) mapping is used.
3. (a) Explain the following techniques for I/O operation : $5+5=10$
- (i) Programmed I/O
 - (ii) Interrupt driven I/O
- (b) Explain the following terms with respect to hard disks. 6
- (i) Access time
 - (ii) Bandwidth
 - (iii) Rotation speed
- (c) Find the average latency of a disk system whose rotation speed is 5000 RPM. 4
4. (a) Explain the following Addressing modes in Assembly language programming with the help of an example each. 9
- (i) Register Addressing
 - (ii) Indirect Addressing
 - (iii) Relative Addressing
- (b) List five important characteristics of RISC Architecture. 5
- (c) What is a pipeline in a computer systems ? Illustrate its advantage using an Instruction pipeline. 6

5. (a) Write an assembly language program using 8086 assembly language to find the length of a string. Make suitable assumptions. 6
- (b) Explain the following terms, giving an example/diagram, if needed 14
- (i) Flip-flop
 - (ii) Register
 - (iii) Single precision floating point representation
 - (iv) Multiplexer
 - (v) Assembler
 - (vi) Int 21 h
 - (vii) Fetch cycle.
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