MCS-012

MCA (Revised)

Term-End Examination

June, 2007

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) Simplify the following boolean function using Karnaugh map method :

$F(A, B, C, D) = \Sigma(1, 2, 5, 6, 7, 8, 9, 11, 12, 15)$

Also, draw the corresponding logic circuit diagram. *8*

(b) Design and draw a 3 × 8 decoder using NOT gates and AND gates and explain its working. *8*

(c) Design a circuit to interface four RAMs of 128 × 8 size and a ROM of 512 × 8 size. Draw the memory map for the same. *8*

(d) Write an assembly language procedure for 8086 microprocessor that divides a 32-bit number by a 16-bit number. The procedure should be written in general, so that it may be defined in one module and can be called in any other module. *10*

(e) List all the features of the RISC architecture. *6*

2. (a) Write an assembly language program for 8086 microprocessor to sort a given list of 5 numbers in ascending order and explain its logic. *10*

(b) Design and draw a master-slave flip flop using JK flip flops. What are the advantages it offers over other flip flops ? *10*

3. (a) Find the following : *9*

(i) 9's complement of $0342_{(10)}$

(ii) 10's complement of $0342_{(10)}$

(iii) 2's complement of $1100110_{(2)}$

(b) Explain the basic principle of Quine-McCluskey method of simplifying the boolean expression with the help of an example function. *6*

(c) Design and draw the 4-bit adder-subtractor circuit using full adders and XOR gates. Explain its working in brief. *5*

4. (a) Give the Excitation tables and Block diagrams for the following : *10*

(i) D flip-flop

(ii) T flip-flop

(b) Write an assembly program to concatenate two strings of size 3 characters and explain its logic. *10*

5. Explain the following : *5×4=20*

(i) Flash memory

(ii) Direct Memory Access (DMA)

(iii) Jaz drive

(iv) Instruction pipelining

(v) Hardwired control organization