Code: DC04 **Subject: COMPUTER ORGANISATI**
Time: 3 Hours **Max. Marks: 10**

DECEMBER 2010

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after half an hour of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: **(2 × 10)**

a. The 2's complement form (use 6 bit word) of the number 1101 is

(A) 110001 **(B)** 110011
(C) 111001 **(D)** 111011

b. The radix of binary no. is _____

(A) 2 **(B)** 1
(C) 3 **(D)** 7

c. In reverse polish notation, expression (A+B)*(C+D) is written as

(A) AB*CD+ **(B)** AB+CD*+
(C) AB+CD+* **(D)** AB+*CD+

d. In computers, subtraction is generally carried out by

(A) 9's compliment. **(B)** 2's compliment.
(C) 1's compliment. **(D)** 10's compliment.

e. Translation from symbolic program into binary code is done in

(A) Two passes **(B)** Directly
(C) Three passes **(D)** Four passes

f. Which of the following is not a memory-reference instruction?

(A) ISZ. **(B)** INC.
(C) BSA. **(D)** LDA.

g. A three input NAND gate gives logic low output only when

(A) one input is low **(B)** two inputs are low
(C) all inputs are low **(D)** all inputs are high

h. Which of the following is not a physical memory?

(A) Main memory. **(B)** Secondary memory.
(C) Virtual memory. **(D)** None of the above.

i. In synchronous transmission, data are transmitted

(A) 1-bit at a time **(B)** 1-character at a time
(C) 1-block of characters at a time **(D)** None of the above.

j. Which of the memory uses capacitor technology?

(A) Static memory **(B)** Dynamic memory
(C) Virtual memory **(D)** None of the above.

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Simplify the following Boolean function F together with don't care d in Sum Of Products by means of a four variable map. Draw the logic diagram also $F(A,B,C,D) = \sum m(1,3,7,11,15) + d(0,2,5)$ **(8)**

b. Convert $(55.75)_{10}$ decimal no. into Binary no. system. **(2)**

c. Show how a JK flip-flop can be converted to a
(i) D flip flop
(ii) T flip flop **(6)**

Q.3 a. Draw the logic diagram of a 4-bit combinational circuit which can shift the data left as well as right depending upon a control signal. **(7)**

b. Briefly explain what do you understand by instruction set completeness. **(5)**

c. What are the advantages and disadvantages of high-level language over assembly language? **(4)**

Q.4 a. Derive the control gates LD, INC and CLR associated with the accumlator AC in the basic computer. **(10)**

b. Write the symbolic description of the following memory-reference instructions:-
(i) AND (ii) ADD
(iii) LDA (iv) STA
(v) BUN (vi) BSA **(6)**

Q.5 a. What do you understand by "addressing mode"? Explain the types of addressing mode with example. **(8)**

b. Write a program to evaluate the arithmetic statement:
X = (A * B) + (C * D)
(i) Using a general register computer with two address instruction.
(ii) Using a stack organized with zero-address operation instruction. **(4)**

c. What are the functions of following pseudo-instructions?
(i) ORG N (ii) END
(iii) DEC N (iv) HEX N **(4)**

Q.6 a. Write an assembly language program to multiply two positive numbers. Give its flow chart also. **(9)**

b. What is the function of interrupt facility in a multiprogram environment? Explain how a source routine is initiated for the input or output transfer. List the tasks which this service routine is supported to perform. **(7)**

Q.7 a. Draw the flowchart of division of floating-point number algorithm. **(8)**

b. Write the algorithm for adding and subtracting two binary no. in signed 2's compliment representation. Subtract 1100011 – 1000111 using 2's complement form. **(8)**

Q.8 a. What do you mean by DMA? Explain DMA controller. **(10)**

b. Differentiate between static RAM and dynamic RAM. **(6)**

Q.9 Write short notes on the following:

(i) Virtual Memory
(ii) Demand Paging
(iii) Associative Memory
(iv) Cache Memory **(4×4 = 16)**