MCA DEGREE I SEMESTER EXAMINATION, DECEMBER 2006

CAS 2104 COMPUTER ORGANIZATION

Time: 3 Hours   Maximum marks : 50

PART A
(Answer *ALL* questions)
(Each questions carry *TWO* marks)

(5 x 6 = 30)

I. (a) Design a full adder.
    (b) Why NAND gate is called the universal building block.
    (c) What is the role of parity bits in data transfer.

II. (a) Simplify the Boolean function $f(A,B,C) = \Sigma(0,2,6)$ having the don't care condition $d(A,B,C) = \Sigma(1,3,5)$.
    (b) Differentiate between a macro and a subroutine.
    (c) What do you mean by cycle stealing ?

III. (a) How is a floating point number represented in computer memory ?
     (b) What are the schemes used for memory representation of characters.
     (c) Assuming 5 bit binary numbers with the left most being the sign bit, perform the following subtractions using both 1's and 2's complements.
         (i)   00101 -
               00100
         (ii) 01011 -
               01101

IV. (a) What are combinational circuits ?
    (b) Draw an eight input multiplexer circuit.
    (c) What is the significance of control store of a computer ?

V. (a) Why every computer should have a boot strap routine ?
    (b) What are the commonly used storage devices ?
    (c) What are internal interrupts ?

PART B
(Answer *ALL* questions)
(Each questions carry *FOUR* marks)

(5 x 4 = 20)

VI. A. Explain the interrupt driven data transfer.
                                    OR
     B. Explain direct memory access data transfer.

VII. A. Draw a master slave JK flip flop using NAND gates and explain how the race around problem is solved.
                                    OR
     B. Draw a 4 bit Binary ripple counter and show how the output changes with every clock pulse.

(Turn over)

VIII. A. Draw a logic circuit to drive a seven segment LED display from the output of a decade counter; assuming no invalid combinations occur at the output of the counter.

OR

B. Design a logic circuit to pick up the prime numbers occurring at the output of a 4 bit binary counter.

IX. A. Write five addressing modes used in a typical computer. Explain each with an example.

OR

B. Differentiate between cache memory and virtual memory.

X. A. Write an assembly language program which finds the maximum of three single byte integers and displays it.

OR

B. Write a subroutine in assembly language that search for a given integer in an array of integers and return 1 if found and 0 if not found.

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