Name: **Id#**

COE 205, Term 011

Computer Organization & Assembly Programming

Quiz# 1

Date: Saturday, Sep. 22, 2001

Q1. Consider an 8-bit register that has the binary number 11100100. Determine the decimal value of the number if it represents:

    i.   An unsigned number.

    ii. A signed number in sign-magnitude representation.

    iii. A signed number in 1's complement representation.

    iv. A signed number in 2's complement representation.

    v. A character where the most significant bit is a parity bit. Is the parity bit even or odd parity. Note that the ASCII code of character 'a' is 61H.

Q2. Perform the following arithmetic operations assuming that numbers are represented using 8-bit 2's complement representation. Indicate in your answer when an *overflow* occurs.

    i. 01111100 + 00000100

    ii. 11111101 - 01111110

Q3. Indicate whether the following is true or false, and if it is false **correct it**:

(1) (True, False)   The program counter is a register in the CPU that counts the number of instructions executed by the CPU.

(2) (True, False)   In the fetch-execute cycle, the instruction and its operands are read from memory in the fetch phase.

(3) (True, False)   The instruction pointer is always incremented by 2 after fetching an instruction from memory.

(4) (True, False)   Assuming 8-bit 2`s complement representation, the smallest (negative) number is 11111111 and the largest (positive) number is 01111111.

(5) (True, False)   The ASCII code representation of the decimal number 28 is expressed in hexadecimal as 3238. Note that the ASCII code for the digit 0 is 30H.

(6) (True, False)   A CPU with a 32-bit address bus and a 32-bit data bus can access a memory of size 4 Mbyte, and transfer a maximum of 5 bytes in a read or write cycle.

(7) (True, False)   The instruction register and the program counter are part of the instruction set architecture of a computer.