

Name:

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COE 205, Term 021
Computer Organization & Assembly Programming

Quiz# 1

Date: Wednesday, Oct. 2, 2002

Q1. Consider an 8-bit register that has the binary number 11000110. 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.

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. $01111111 + 00000001$

ii. $11111111 - 01111111$

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

(1) (True, False) The instruction register is a register in the CPU that contains the address of the next instruction to be executed by the CPU.

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

(3) (True, False) The instruction pointer is always incremented by 1 after fetching an instruction from memory.

(4) (True, False) Assuming 6-bit 2's complement representation, the smallest (negative) number is 111111 and the largest (positive) number is 011111.

(5) (True, False) The ASCII code representation of the decimal number 64 is expressed in hexadecimal as 3634. Note that the ASCII code for the digit 0 is 30H.

(6) (True, False) A CPU with a 32-bit address bus and a 64-bit data bus can access a memory of size **4 Gbit**, and transfer a maximum of **6 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.

(8) (True, False) The binary number 11000110 represents character **f**, and uses an odd parity bit. Note that the ASCII code of character **A** is 41H and that of character **a** is 61H.