

Name:

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COE 205, Term 991

**Computer Organization & Assembly Programming
Quiz# 1**

Date: Saturday, Sep. 25

(I) Consider the following two numbers $A=-200$ and $B=-121$

- (1)** Express the two numbers in both sign-magnitude and 2's complement notations, assuming 9-bit representation.

- (2)** Perform the operation $A+B$ twice, once for sign-magnitude notation and once for 2's complement notation. Indicate in your answer when an overflow occurs.

- (3)** Perform the operation $A-B$ twice, once for sign-magnitude notation and once for 2's complement notation. Indicate in your answer when an overflow occurs.

- (4)** Determine, in binary and decimal, the smallest (negative) number and the largest (positive) number that can be stored using the sign-magnitude notation, assuming 9-bit representation.

- (5) Determine, in binary and decimal, the smallest (negative) number and the largest (positive) number that can be stored using the 2's complement notation, assuming 9-bit representation.

(II) 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 fetched from memory.
- (2) **(True, False)** The fetch-execute cycle refers to the process of fetching the operands of an instruction from memory and then executing the instruction.
- (3) **(True, False)** The program counter is the register in the CPU counting the number of instructions executed so far by the CPU.
- (4) **(True, False)** The instruction set architecture includes the instruction set, the machine's memory, and all the registers in the machine.
- (5) **(True, False)** There is a one-to-one mapping from an assembly instruction to a machine instruction, but a one-to-many mapping from a high-level language to a machine language.
- (6) **(True, False)** Assembly programs written for the Intel 8086 family processors can run on the Motorola 68000 processors using the Motorola assembler and linker programs.