# COE 205, Term 001 <br> Computer Organization \& Assembly Programming 

## Quiz\# 1

Date: Saturday, September 23
Q1. Consider the following two numbers $\mathbf{A}=\mathbf{- 1 4 4 4}$ and $\mathbf{B}=\mathbf{6 0 4}$, and assume that they will be represented using 12 bits:
a. Express the two numbers in both sign-magnitude and 2`s complement notations.
b. 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.

Q2. 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) The instruction and its operands are read from memory in the fetch phase of the fetch-execute cycle.
(True, False) The Instruction Pointer is the register in the CPU that contains the address of the next instruction to be fetched from memory while the program counter is the register in the CPU counting the number of instructions executed so far by the CPU.
(4) (True, False) Assuming 6-bit 1`s complement representation, the smallest (negative) number is 100000 and the largest (positive) number is 011111. (5) (True, False) The ASCII code representation of the decimal number 132 is expressed in hexadecimal as 313332 . Note that the ASCII code for the digit 0 is 30 H . (6) (True, False) A CPU with a 20-bit address bus and a 32-bit data bus can access a memory of size 1 Mbit , and transfer a maximum of 5 bytes in a read or write cycle. (7) (True, False) The 15`s complement of the 4-digit hexadecimal number (EB10) ${ }_{16}$ is $(14 \mathrm{E} 0)_{16}$ while the 16 s complement is $(14 \mathrm{E} 1)_{16}$.

Q3. Briefly answer the following questions:
a.

What is the ISA (instruction set architecture) of a computer?
b.

> List two advantages for programming in assembly language?

