CMPS-2240 Quiz-4   name _____
Each question is worth 1 unless noted.
Clearly indicate your answers.

1. If your data in memory is word-aligned,

      A. you are working with an integer array.
      B. you are not on a Mac.
      C. the 2 LSB's of the data values are zeros.
      D..four divides each data's address value.
Addresses are aligned, not data at the address.

2. Your computer stores memory addresses in little-endian format.
  Which of the following could be a valid address of a MIPS instruction?

      A. 00101010011010100101010010101100
      B. 11110011000000110000110011111110
      C..11001100010011000100110001000001
      D. 00000001010111010101110101011100
Right 2 bits of first byte are zeros.
Address of a mips instruction, not in a mips instruction.

3. Why are CISC processor architectures popular?

      A..More processing can be done with fewer instructions.
      B. Because they operate on CISCO routers.
      C. Programs run faster than on a RISC processor.
      D. The architecture emphasizes software.

4. Comparing MIPS and x86 architectures reveals that...

      A. MIPS memory is byte-addressable, while x86 memory is bit-addressable.
      B. Fewer instructions result in smaller programs. <--no, larger.
      C. MIPS uses a stack, while x86 uses a queue.
      D..MIPS has fewer instructions than x86.

5. When a program is executing...

      A. each machine instruction is placed on the stack.
      B. machine instructions are copied into $pc just before execution.
      C..machine instructions can be found in main memory.
      D. the program counter is incremented by 4 after each instruction.

6. The instruction that follows a jump instruction in memory...

      A. cannot be another jump or branch instruction.
      B..remains in the pipeline, and is executed.
      C. is not executed, because the $pc was set to the jump address.
      D. is an instruction that does "no operation".

7. When a MIPS j instruction is executed, the jump address contained in the machine instruction...

    A. is copied to the $pc register. <-- not directly copied.
    B..is bit-shifted 2 to the left. <-- among other things.
    C. is bit-shifted 2 to the right.
    D. is added to the 4 MSB's of the program counter.

8. This command: sll $0, $0, 0

    A. stores the local address of a long-jump address.
    B. should not be used after a jump or branch instruction.
    C. does nothing.
    D..is safe to use anywhere in your program.
    E is skipped by the branch controller.

Wikipedia says a nop instruction does nothing. It also says it is used for memory alignment and timing operations. ssl is executed by the processor, takes a slot in the pipeline, and causes an increment to $pc.
Half the class chose C, so I will allow answers C, D.

9. Your program is running when it encounters a jump instruction.
  Here is your encoded j instruction: 00001001101010001100101010001110
  Here is the current program counter: 10011100101111000000010101100010
  What address will your program jump to?

    A. 00000001101010001100101010001110
    B..10010110101000110010101000111000
    C. 00000110101000110010101000111000
    D. 00011010100011001010100011101001

10. What is the value in register $t2 after the following code executes.

    addiu $t0, $0, -15
    addiu $t1, $0, 5
    sltu $t2, $t0, $t1

    A. -10
    B. 10
    C. 1
    D..0

11. Which of the following formulas can be used to express a computer's performance ability?

    A. time/program = cycle/time x cycles/instruction x instructions/program
    B..time/program = time/cycle x cycles/instruction x instructions/program
    C. time/program = time/cycle x instructions/cycle x instructions/program
    D. time/program = time/cycle x cycles/instruction x program/instructions