The UNIVERSITY *of* NORTH CAROLINA *at* CHAPEL HILL

Comp 411 Computer Organization

Quiz #1
Sample

Don't Panic! Write your answers on the Answer Sheet. Each question below is followed by several possible answers, each labeled with a letter, e.g., (A), (B), etc. Write the letter that corresponds to your chosen answer in the appropriate blank on the answer sheet.

1. Which of the following is largest the positive 16-bit 2's complement integer?

   (A) 32767 (B) 32768 (C) 65535 (D) 65536 (E) none of these

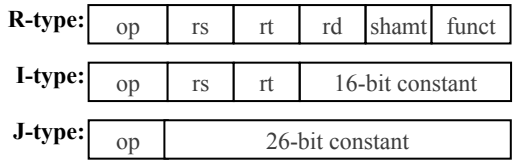
2. Which 8-bit sign-magnitude binary number represents 144?

   (A) 10001000_2 (B) 01111000_2 (C) 11111000_2 (D) 01110111_2 (E) none of these

3. Which of the following operations cannot be performed with a single MIPS addi instruction?

   (A) Copying the contents of one register to another
   (B) Subtracting a small constant from a register
   (C) Loading small constants into a register
   (D) Negating the contents of a register
   (E) Loading the effective address of a lw or sw instruction into a register

There are 3 basic instruction formats in the MIPS instruction set architecture. They are:



4. Which field in the I-type instruction determines if the 16-bit constant is treated as a signed or unsigned value?

   (A) op (B) rs (C) rt (D) The constant itself (E) None of these

5. What field determines the operation of an R-type instruction?

   (A) op (B) shamt (C) funct (D) The absence of the rd field (E) none of these

Various I-type MIPS instructions interpret their immediate operands as:
1) A signed value
2) An unsigned value
3) A signed value multiplied by 4

6. Which of the following instructions treat their immediate field as an unsigned value?

   (A) addu (B) addi (C) ori (D) beq (E) lw

7. Which of the following instructions treat their immediate field as a signed value multiplied by 4?

   (A) addu (B) addi (C) ori (D) beq (E) lw

8. Which of the following statements concerning the beq instruction is **false**?
   (A) It adds the value of the signed 16-bit constant field to the address of the beq instruction and uses that address for the next instruction if the contents of rs and rt are equal.
   (B) It is an I-format instruction
   (C) It can be used to implement unconditional branches
   (D) Its branching range is limited to a subset of addresses around the branch instruction
   (E) It can be used to implement the semantics of a "while" loop

9. The instruction, nor $rd,$rs,$0 is commonly used to complement the contents of a register. Which of the following alternatives has the same effect?

   (A) xori $rd,$rs,0xffff
   (B) and $rd,$rs,0xffff
   (C) sub $rd,$0,$rs
   (D) sub $rd,$0,$rs
       addi $rd,$rd,-1
   (E) ori $rd,$rs,0xffff

1. What is the function of the RA register in the MIPS architecture?
2. If you complement 0xDEADBEEF (that is one's complement), what hex number do you get?
3. What decimal number does 0xFFFFFFF8 represent on a 32-bit computer using 2's-complement arithmetic?