Name: Id#

COE 301/ICS 233, Term 172

Computer Architecture & Assembly Language

Quiz# 3

Date: Thursday, March 1, 2018

# **Q1.** Fill in the blank in each of the following questions:

## The pseudo instruction *ble $s2, $s1, Next* is implemented by the following minimum MIPS instructions:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Assume that the instruction *bne $t0, $t1, NEXT* is at address 0x00400020 in the text segment, and the label NEXT is at address 0x00400010. Then, the address stored in the assembled instruction for the label NEXT is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

## Assuming that variable Array is defined as shown below:

Array: .byte 1, 2, -3, 4

After executing the following sequence of instructions, the content of the three registers is $t1=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, $t2=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and $t3=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

la $t0, Array

lb $t1, 2($t0)

lh $t2, 2($t0)

lw $t3, 0($t0)

## The content of register **$t0** after executing the following code is \_\_\_\_\_\_\_\_\_\_:

li $s1, 0x4321

xor $t0, $t0, $t0

Next:

andi $t1, $s1, 0xf

add $t0, $t0, $t1

srl $s1, $s1, 4

bne $s1, $0, Next

## **Q2.** Write a MIPS assembly fragment for the following IF statement:

## **if ( [(a == b) || ( c== d) ] && (a < c) ) then b = d ;**

## Assume that variables a, b, c, and d are stored into registers $s0, $s1, $s2, and $s3, respectively.

## **Q3.** Write a MIPS assembly fragment for displaying the binary content of register $s0. Note that the system call for printing a an integer in $a0 sets $v0 to 1.