



Quiz 4 (Fall 2022) - Solution

Course Name: Computer Organization

Time: 20 mins

Instructor: Dr. Ayaz ul Hassan Khan

Name: _____ Identification #: _____

Date: _____ Total Marks: 10 Marks Obtained: _____

Signature of Instructor: _____

Consider the following C code functions, assume that the first function is called first. Write the translated MIPS assembly functions for these C code functions.

```
int compare(int a, int b) {  
    if (sub(a, b) >= 0) return 1;  
    else return 0;  
}
```

```
int sub(int a, int b) {  
    return a - b;  
}
```

Solution:

compare:

```
addi $sp, $sp, -4    # allocate frame = 4 bytes  
sw   $ra, 0($sp)     # save return address  
jal  sub             # call sub  
li   $t0, 0          # result = 0  
bltz $v0, exit       # if sub(a,b)<0 goto exit  
li   $t0, 1          # result = 1
```

exit:

```
move $v0, $t0        # $v0 = result  
lw   $ra, 0($sp)     # restore return address  
addi $sp, $sp, 4     # free stack frame  
jr   $ra             # return to caller
```

sub:

```
sub  $v0, $a0, $a1    # result = a - b  
jr   $ra             # return to caller
```