Exam II Rework

**Question 3**

1) *Why:*

I was confused about what $a0 represent so that I do not want to waste the time on this bonus question.

2) *How:*

$a0 contains the base address of the new string.

$s0 contains the current index of the character in old string.

$t1 contains the address of current byte (character).

$t2 contains the current character and then being converted to lower case by adding 32.

$t3 contains the destination address of where to save the converted character.

The program loads a byte (character), convert it, and store it repeatedly until 0 is reached. $s0 should be saved first to the stack and retrieved after the function execution.

This subroutine is to convert an upper-case string to a lower-case one.

**Question 13**

1) *Why:*

Intuitively I think the instruction is simply “mul $s0, $s1, $s2”. But I miss the keyword “best” in the description.

2) *How:*

“Shift left three logically” is the same as “times 8” but requires less cycle. The answer should be “sll $s0, $s1, 3”.

**Question 14**

1) *Why:*

My answer is “00000010” and “0x008000F0”. I put “0x” by accident.

2) *How:*

“0x008000F0” should be “008000F0”.

**Question 18**

1) *Why:*

I got only this one wrong:

“Using lw and sw instruction to transfer data between processor and I/O devices”.

I select “How” but this one is about where the data transfer occurs.

2) *How:*

Data transfer occurs between processor and I/O devices. This is a “Where”.

**Question 19**

1) *Why:*

I mistakenly selected “d.” as one of a correct answer because I have a misunderstanding of where floating-point operation is performed.

2) *How:*

ALU does not perform floating point arithmetic operations but FPU does.

**Question 19**

1) *Why:*

For [b],$t1,[c][d], I use “mul, $t1, $t0, 8” , which is wrong because the statement requires that “it will run using the least clock cycles”, similar to Question 13.

2) *How:*

“mul, $t1, $t0, 8” should be replaced by “sll, $t1, $t0, 3”.