Exam Rework

**Question 1**

1) *Why:*

I am correct on [c], [d] and [e]. But In [b], I answered “assembler” because I thought that in order to obtain the object code, assembler is needed to translate from source file obtained from compiler to object code. However, I missed one possibility that complier can directly translate source code to object code.

2) *How:*

The answer in [b] should be “complier” because code written in high level language can be translated into object code without needing to translate to assemble language first.

**Question 2**

1) *Why:*

I selected b. c. and d.

I mistakenly select b. as a correct answer because I thought that was how linker works. But in fact, several keywords are missing in this statement like “library” and “one or many object files”.

2) *How:*

I should keep the details in mind and read the statement carefully.

**Question 3**

1) *Why:*

I selected b. c. and d.

I mistakenly select b. as an answer because I did not read the statement carefully. I thought “string” is an array of characters and each character can be represented by an ASCII number and each ASCII number is corresponding to a hexadecimal value. But that is not correct.

2) *How:*

Not selecting “Strings are represented as arrays of hexadecimal digits.”. It should be “Strings are represented as arrays of characters.”.

**Question 4**

1) *Why:*

I am correct in [x] and [y].

In [z], My answer is 98 so I put 98 to the box but that is not in the correct format.

2) *How:*

I need to output what’s inside $t0 not just the byte being copied. So, the $t0 register (32bit) should contain: 00000098

**Question 10**

1) *Why:*

I forgot the branching and jumping instruction.

1) *How:*

The next PC should be updated to contain the calculated or directed address of next position determined by branching and jumping instruction or to contain PC + 4. So, it is not always PC + 4.

**Question 11**

1) *Why:*

I forgot the format of the sw.

I obtained the same instruction as the answer but forgot the instruction format of “sw”. I put “sw $t0, $s0, 24” to the answer but the correct one should be “sw $t0, (24)$s0”.

2) *How:*

I need to get more practice on this to keep in mind the format of each instruction.

**Question 13**

1) *Why:*

I did not select the choice b because I do not have a deep understanding of the “word”. And I mistakenly select c. because I do not have a deep understanding of how data and instructions are arranged in the memory.

2) *How:*

The word does not have any inherent meaning but just a convenient way for describing 4 bytes. The data and instructions are separated from each other. A data word cannot be located between two instruction words.

**Question 15**

1) *Why:*

I have misunderstanding about the function of ALU. I know that PC will point to the instructions that is going to perform but I thought to update the content of the PC, ALU should be used to actually calculate that, which is wrong.

2) *How:*

The PC content is updated automatically not involving ALU. The ALU is simply used for actual arithmetic and logic calculation.

**Question 17**

1) *Why:*

I have correct answers on “lui” and “ori” but got wrong in the immediate value. I convert F1F2 to -3598 and E3E4 to -7196 and put the decimal there. And I did not realize that the negative number cannot be loaded for “lui” or “ori”.Instead, I should directly use the hexadecimal representation.

2) *How:*

Simply grab the first half hexadecimal and second half hexadecimal so that “lui” and “ori” will work perfectly.

**Question 19**

1) *Why:*

I forgot the instruction of “sll”.

I know the instruction is doing multiplication by 4. But I completely forgot we have “sll” instructions.

2) *How:*

Shift left logically 2 position means current value \* 4. So we can directly use “sll”.

**Question 22**

1) *Why:*

My answer is “Whoosh!..z...”. I did not have a deep understanding about the null termination.

During the exam, I notice there is a “\n” at the end of “Whoosh!”. But at that time, I thought the whole content given in the data segment should represent a single string, so I simply combined the two strings together, which is incorrect.

2) *How:*

I should simply stop at the “\n” null termination and grab the answer there.

**Question 24**

1) *Why:*

I mistakenly selected b. I know the fact that pseudo instructions should be first translated but ignoring the fact that the translation is performed by assembler not MIPS processor.

I did not select a. because at the first glance I did not pay attention to that statement. And when I clicked on next, I realized that a. is also correct, but I cannot go back.

2) *How:*

I should enhance my understanding of relationships among MIPS language, MIPS processor and assembler and be careful when read the questions. The MIPS processor can only read simple instructions and pseudo code should be first translated to simple instructions. The pseudo instructions are simply for the convenience for programmer.