Started on	Tuesday, 6 October 2020, 5:00 PM
State	Finished
Completed on	Tuesday, 6 October 2020, 5:14 PM
Time taken	14 mins 1 sec
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

Complete

Not graded

Choose valid statement(s) for compositional logic circuits from the list below:

Select one or more:

- [ ] The output of a compositional logic circuits, in addition to current input values, might depend on the previous input values as well
- [ ] These circuits might contain memory elements (registers)
- [ ] These circuits must contain memory elements (registers)
- [x] This type of circuits is used to implement arithmetic and logic operations for processors
- [ ] No choice is correct

Due to the typo in the question formulation (the usage of "compositional" instead of "combinational" term), the question is excluded from grading

The correct answer is: This type of circuits is used to implement arithmetic and logic operations for processors

Question **2**

Correct

Mark 1.00 out of 1.00

Convert decimal number "-28" to 8-bit binary number, by using two's complement method for representing negative numbers.

Answer: 11100100 ✔

The correct answer is: 11100100

Question 3

Correct

Mark 1.00 out of 1.00

Recall the basic principles behind an ALU unit of a processor. Do you agree with the following statement?

Any arithmetic operation, which is defined for decimal values (such as addition, subtraction, multiplication, division) can be implemented by means of a logic circuit (either combinational or sequential), for binary inout values.

Select one:

- a. Yes, totally agree! ✔
- b. Completely disagree! For example, there is no operation of subtraction in Boolean algebra, and thus, subtraction operation cannot be implemented for binary input values?!

Your answer is correct.

The correct answer is: Yes, totally agree!

Question 4

Correct

Mark 1.00 out of 1.00

Do you agree that the use of saturation arithmetic principles solves the overflow and underflow problems for arithmetic operations, without any loss of precision or computation correctness?

Select one:

- True
- False ✔

The correct answer is 'False'.

Question 5

Correct

Mark 1.00 out of 1.00

Recall an encoder circuit. Do you agree that, according to its definition, only one input pin can be set to "1", while all others must remain "0"?

Select one:

- True ✔
- False

The correct answer is 'True'.

Question 6

Correct

Mark 1.00 out of 1.00

Do you agree that the hexadecimal numeral system is a positional system?

Select one:

- True ✔
- False

The correct answer is 'True'.

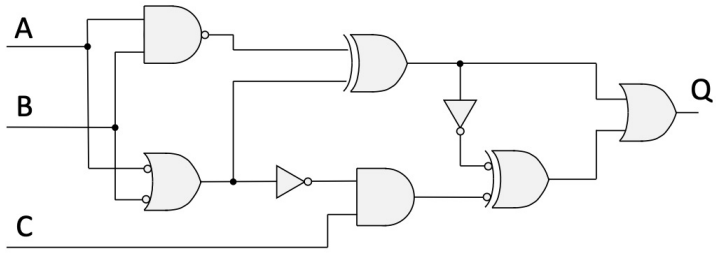
Question 7

Correct

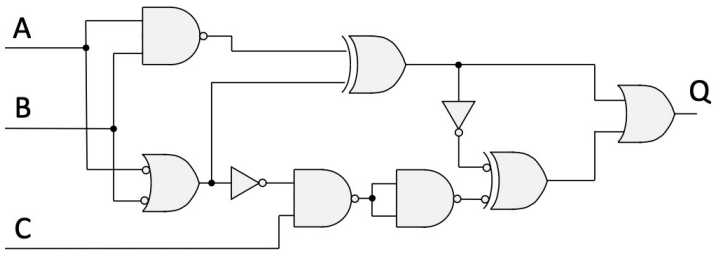
Mark 1.00 out of 1.00

Do you agree that the following two logic circuits are equivalent?

Circuit 1



Circuit 2



Select one:

- True ✔
- False

The correct answer is 'True'.

Question 8

Correct

Mark 1.00 out of 1.00

Recall the basic building blocks for compositional logic circuits. Which of the following circuits have(s) the number of output pins exceeding the number of input pins? Note: do not count control or selector pins as input pins.

Select one or more:

- a. multiplexer
- b. demultiplexer ✔
- c. decoder ✔
- d. encoder
- e. No choice is correct

Your answer is correct.

The correct answers are: demultiplexer, decoder

Question 9

Correct

Mark 1.00 out of 1.00

What is the minimum required number of input pins for a decoder with 19 output pins?

Answer: 5 ✔

The correct answer is: 5

Question 10

Correct

Mark 1.00 out of 1.00

Do you agree that any logic gate can be implemented by using only NAND logic gates?

Select one:

- a. No! It would be correct if, in addition to NAND, we could use NOR logic gate as well
- b. No choice is correct
- c. Yes ✔

Your answer is correct.

The correct answer is: Yes

Question **11**

Correct

Mark 1.00 out of 1.00

Convert decimal number "256" into hexadecimal numeral system.

Note: Use capital letters "A", "B", "C", etc., in your answer, if needed.

Answer: 100 ✔

The correct answer is: 100