CS-2110 Quiz 1A

Alan Chiang

TOTAL POINTS

100 / 100

QUESTION 1

1 Unsigned Binary to Decimal 10 / 10

+ 0 Graded
+ 5 a) 17
+ 5 b) 237

QUESTION 2

2 Decimal to Binary 42 / 42

+ 0 Graded
+ 7 a) Signed Magnitude 11101010
+ 7 a) 2's Complement 10010110
+ 7 b) Signed Magnitude 10111010
+ 7 b) 2's Complement 11000110
+ 7 c) Unsigned Binary 01010001
+ 7 c) 2's Complement 01010001

QUESTION 3

3 Unsigned Binary Addition 28 / 28

+ 0 Graded
+ 7 11010001
+ 7 209
+ 7 00001100 or 100001100(leading 1 added by overflow)
+ 7 12 or 268 if binary has 9 bits

QUESTION 4

4 Logisim 20 / 20

+ 0 Graded
+ 10 Splitting wires
+ 10 Joining wires

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Name: Alan Chiang Section: 3:00
Klaus 1443

Binary Conversion and Addition: (____ / 80)

1. Convert the 8-bit **unsigned binary** numbers to decimal.

a) 00010001

Decimal: 17

b) 11101101

Decimal: 237

2. Convert the decimal numbers to the given binary representations.
PLEASE EXPRESS ALL NUMBERS WITH 8 BITS (padding the front with 0s if needed)

a) -106

Signed Magnitude: 11101010

2's Complement: 10010110

b) -58

Signed Magnitude: 10111010

2's Complement: 11000110

c) 81

Unsigned Binary: 01010001

2's Complement: 01010001

3. Add the following **unsigned binary** numbers and convert them to decimal.
PLEASE EXPRESS ALL NUMBERS WITH 8 BITS (padding the front with 0s if needed)

a) 10110110
+ 00011011
11010001

Unsigned Binary: 11010001

Decimal: 209

b) 00101101
+ 11011111
100001100

Unsigned Binary: 100001100

Decimal: 268

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Name: Alan Chiang Section: 3:00 Klaus 1443

Logisim: (___ / 20)

1. What is a Splitter/Joiner and what can it be used to do?

A splitter/joiner is a Logisim device that divides multibit inputs into multiple outputs which together have the same number of bits as the input. It also does the same in reverse, combining multiple inputs into a single multibit output.

8-bit input turns to two 4-bit outputs

Two 2-bit inputs turn into one 4-bit output