Q1
4 Points

Convert the following 8-bit binary number to decimal as both an unsigned and signed integer. Assume the following number is in 2's complement when converting to a signed decimal number.

1001 0101

Q1.1
2 Points

Unsigned Integer =

149

Q1.2
2 Points

Signed Integer =

-107

Q2
2 Points

Convert the following decimal number to 8-bit 2’s complement binary.

-33

= 0b____

11011111

Q3
4 Points

Convert the following octal number to binary and hexadecimal. Assume that the following number is unsigned and give your answer in 16 bits.

0o35347

Q3.1
2 Points

Binary : 0b____

011101011100111

Q3.2
2 Points

Hexadecimal : 0x____

3AE7

Q4
1 Point

Given 5 bits, what is the smallest value we can represent in 2's complement binary? Enter your answer in decimal.

-16

Q5
1 Point

Given 8 bits, what is the largest value we can represent in 2's complement binary? Enter your answer in decimal.

127

Q6
1 Point

Given 10 bits, what is the total number of values we can represent in 2's complement binary? Give your answer as an integer in decimal.

1024

Q7
2 Points

Convert the following 32-bit IEEE-754 floating point number from binary to decimal. Express your answer with one digit after the decimal point (e.g. 1.5). If your answer can be written as a whole number, the zero **SHOULD** be omitted (e.g. 1 instead of 1.0)
0 10000010 10000000000000000000000

12

Q8
1 Point

What is the value of the following 32-bit IEEE-754 floating point number? You may reference the following table of IEEE-754 edge cases:

	E==0	0<E<255	E==255
M==0	0	Powers of 2	infinity
M!=0	Non-normalized	Regular numbers	NaN

0 11111111 00000000000000000000000

Not a Number (NaN)

+infinity

-infinity

+0

-0

Q9
1 Point

Between the two following IEEE-754 floating point numbers, which number is greater?

A: 1 11110111 11111111111111111111111
B: 0 11110101 00000000000000000000000

B

A

Cannot be compared

They are equal

Q10
4 Points

Fill in the one-line code snippet to determine if num is non-negative (positive or zero). Return **True** if num is **non-negative** and **False** if num is **negative**. Each blank is meant to be filled with a single bitwise operator or decimal integer. You may assume num is a 16-bit 2's complement binary number.

return ((**A** << **B**) **C** num) == **D**

A:

1

B:

15

C:

&

D:

0

Q11
2 Points

What 8-bit binary number, when inserted into the blank, would allow the equation to hold true?
(0x7B >> 5) | ___ = 0b1010 1011

0b1010 0100

0b1011 1000

0b1010 1000

Q12
2 Points

Which operator, when inserted into the blank, would make the following equation hold true? (>> is the signed right shift). All decimal numbers are represented in 8-bit 2's complement binary.

(57 >> 1) ___ 0b1111 0000 = 0xFC

| (OR)

~ (NOT)

& (AND)

^ (XOR)

Q13
3 Points

What is the result, in **decimal**, of the following 8-bit unsigned binary addition? Please provide the answer in **decimal**.

0b0101 0110 + 0b0110 1100 =

194

Q14
3 Points

Assume A and B are both 8-bit **unsigned binary** numbers. Your answer should be in 8-bit binary and contain no spaces.

A = 0b1011 1010
B = 0b1110 1100

Q14.1
2 Points

A + B = 0b____

10100110

Q14.2 Q14b
1 Point

Based on your answer from the previous question, does the addition overflow?

Yes

Q15
3 Points

Assume A and B are both 8-bit **2's complement** numbers. Your answer should be in 8-bit binary and contain no spaces.

A = 0b1011 1010
B = 0b1110 1100

Q15.1
2 Points

A - B = 0b___

11001110

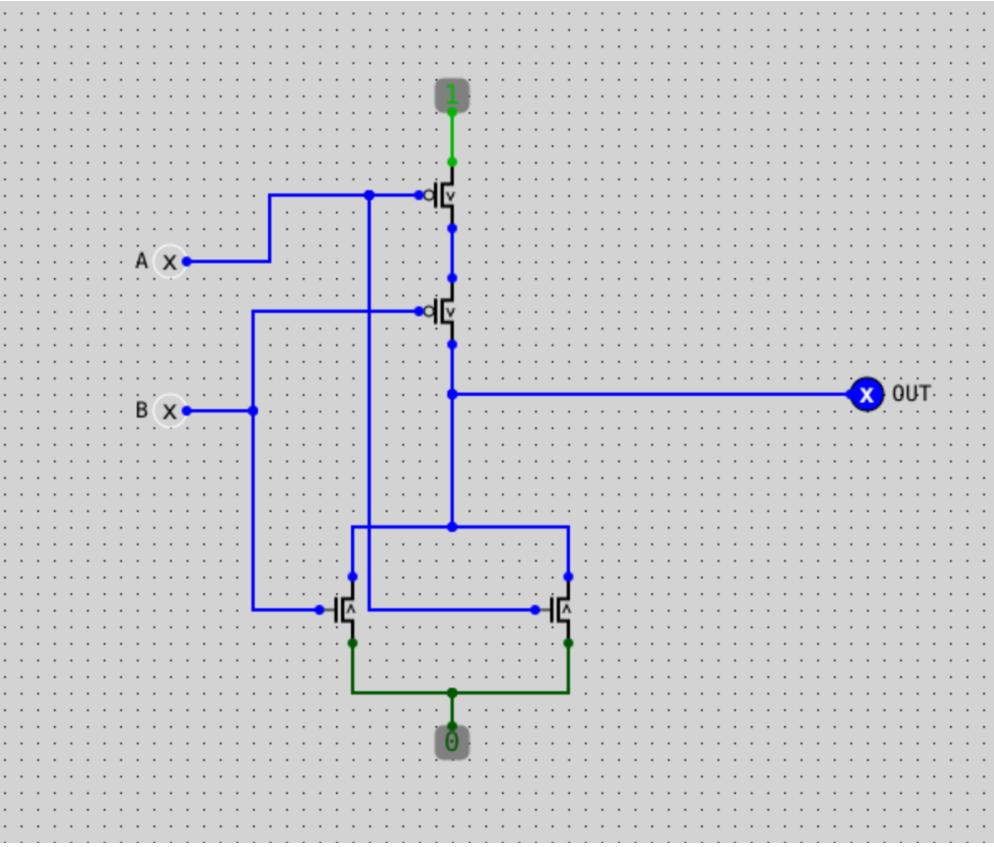
Q15.2
1 Point

Based on your answer from the previous question, does the addition overflow?

No

Q16
2 Points

What gate is modeled by the following transistor diagram?



NAND

AND

NOR

OR

Q17
2 Points

Given the following truth table, write a sum of products boolean expression for F. Do not simplify. Use sum of products notation. Do not add any spaces. (e.g. A'BC+ABC+A'B'C')

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	0

A	B	C	F
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

A'B'C+A'BC+ABC'+ABC

Q18
2 Points

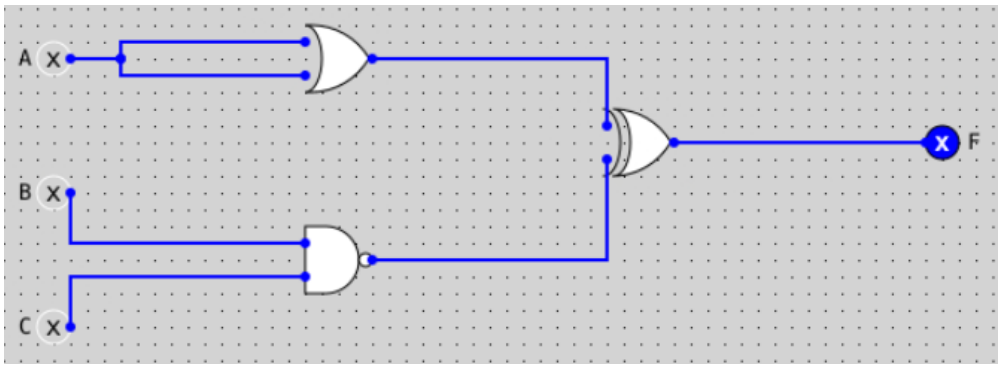
For the below expression, write an equivalent expression using only ~, &, and necessary parenthesis. Leave no spaces in your answer.

W = (~A|B|C)

~(A&~B&~C)

Q19
4 Points

Given the circuit below, fill out its corresponding truth table.



A	B	C	F
0	0	0	**(F0)**
0	0	1	**(F1)**
0	1	0	**(F2)**
0	1	1	**(F3)**
1	0	0	**(F4)**
1	0	1	**(F5)**
1	1	0	**(F6)**
1	1	1	**(F7)**

F0

1

F1

1

F2

1

F3

0

F4

0

F5

0

F6

0

F7

1

Q20 Assumptions
0 Points

If you have to make any unstated assumptions while answering any of the questions on the quiz, let us know the question numbers and assumptions you made here.

Quiz 1C

Graded

Student
Vidit Dharmendra Pokharna

Total Points
43 / 44 pts

Question 1
(no title) **4** / 4 pts

1.1 (no title) **2** / 2 pts

1.2 (no title) **2** / 2 pts

Question 2
(no title) **2** / 2 pts

Question 3
(no title) **3** / 4 pts

3.1 (no title) **1** / 2 pts

3.2 (no title) **2** / 2 pts

Question 4
(no title) **1** / 1 pt

Question 5
(no title) **1** / 1 pt

Question 6
(no title) **1** / 1 pt

Question 7
(no title) **2** / 2 pts

Question 8
(no title) **1** / 1 pt

Question 9
(no title) **1** / 1 pt

Question 10
(no title) **4** / 4 pts

Question 11

(no title) **2** / 2 pts

Question 12

(no title) **2** / 2 pts

Question 13

(no title) **3** / 3 pts

Question 14

(no title) **3** / 3 pts

14.1 (no title) **2** / 2 pts

14.2 Q14b **1** / 1 pt

Question 15

(no title) **3** / 3 pts

15.1 (no title) **2** / 2 pts

15.2 (no title) **1** / 1 pt

Question 16

(no title) **2** / 2 pts

Question 17

(no title) **2** / 2 pts

Question 18

(no title) **2** / 2 pts

Question 19

(no title) **4** / 4 pts

Question 20

Assumptions **0** / 0 pts