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Cpr E 281 LAB07
ELECTRICAL AND COMPUTER ENGINEERING
IOWA STATE UNIVERSITY

Lab 7 Answer Sheet

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PRELAB:

Q1. Before you fill in the answers to this prelab make sure that you understand binary arithmentic, especially signed number representation (2's Complement) and overflow in arithmetic addition and subtraction Do the following arithmetic operations and write down the expected sum, carry and overfow:

In case of subtraction, since we are doing a 2's Complement addition Cout is the carryout of the adder.

Binary numbers to add/subtract	Sum	Cout	Overflow
1011 – 0110	**0101**	**1**	**1**
1001 - 0010	**0111**	**1**	**1**
0001 + 0111	1000	0	1
1100 + 0110	0010	1	0
0011 – 1101	0110	0	0
0101 + 1011	0000	1	0

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Q2. Complete the truth table for a full adder:

X	Y	Cin	Cout	S	
0	0	0	0	0	m_0
0	0	1	0	1	m_1
0	1	0	0	1	m_2
0	1	1	1	0	m_3
1	0	0	0	1	m_4
1	0	1	1	0	m_5
1	1	0	1	0	m_6
1	1	1	1	1	m_7

Q3. Complete the assignment expressions for S and Cout below:

```
module FA (Cin, X, Y, S, Cout);
input Cin, X, Y;
output Cout, S;
assign S = (expression for S);
assign Cout = (expression for Cout);
```

Expression for S:

[redacted] S = x ^ y ^ Cin;

Expression for Cout:

[redacted] Cout = (x&y) | ((x^y)&Cin);

TA Initials: AV

LAB:

Hardware demonstrates a good circuit. TA Initials: MS