

Name and Std ID: _____ Lab Section: _____

Date: _____

PRELAB:

Q1. Before you fill in the answers to this prelab make sure that you understand binary arithmetic, 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 overflow:

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			
1100 + 0110			
0011 – 1101			
0101 + 1011			

Q2. Complete the truth table for a full adder:

X	Y	Cin	Cout	S
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

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:

Expression for Cout:

TA Initials: _____

LAB:

ModelSim demonstrates a good circuit. TA Initials: _____