5b. Half adder summing circuit

b) i) Truth Table

Input		Output	
A	B	S	C
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

i)

A	B	sum
0	0	0
0	1	1
1	0	1
1	1	0

ii)

A \ B	0	1
0	0	1
1	1	0

Like XOR

c) Half adder carry circuit

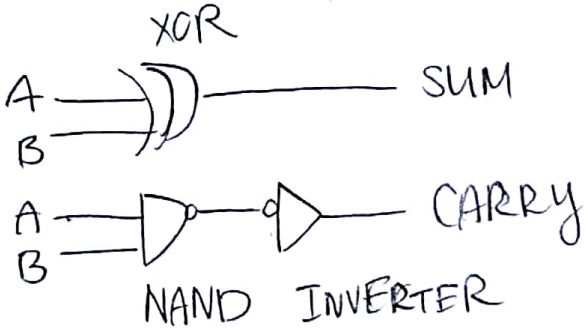
i)

A	B	Carry
0	0	0
0	1	0
1	0	0
1	1	1

ii)

A \ B	0	1
0	0	0
1	0	1

Like AND



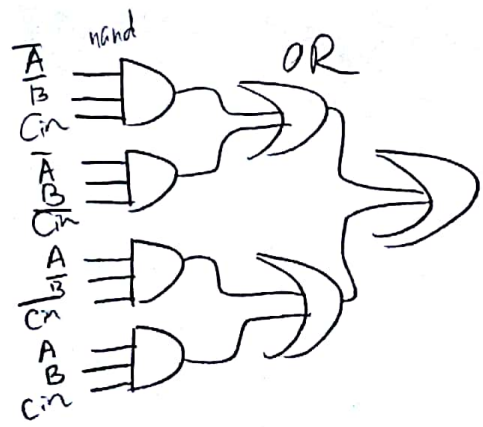
Full adder sum

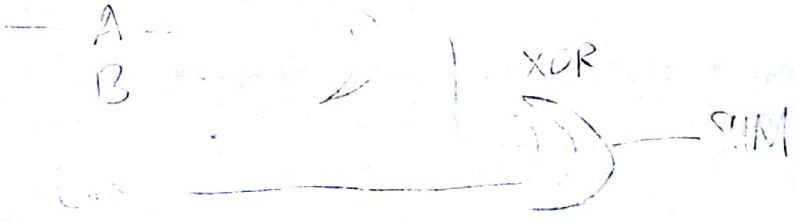
d)

Input			Output
A	B	Cin	Sum
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

A \ BCin	00	01	11	10
0	0	1	0	1
1	1	0	1	0

$S = \bar{A}\bar{B}Cin + \bar{A}B\bar{C}in + ABCin + A\bar{B}\bar{C}in$





Colleen Lau EE 307
hw 2
#5

5.e) Fuller adder carry circuit

I

Input			Output	
A	B	Cin	sum	Carry
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

II Carry kmap

A \ BCin	00	01	11	10
0	0	0	1	0
1	0	1	1	1

Carry = AB + ACin + BCin