

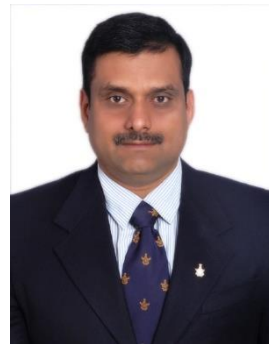


Digital Design : 2020-21

Lab 2

**Parity Generator &
Adders**

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Parity Generator

3-bit Message			Odd Parity Bit
X	Y	Z	
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

Parity Generator

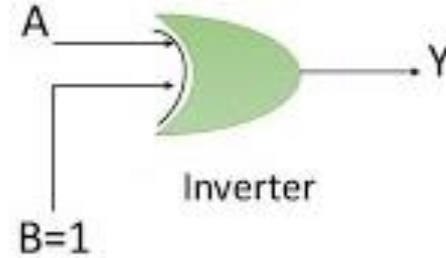
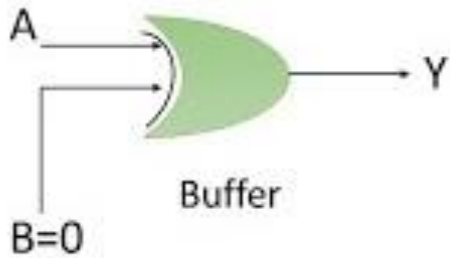
3-bit Message			Even Parity Bit
X	Y	Z	
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

aran.in

Sanja

Parity Generator

EX-OR Gate As Buffer and Inverter

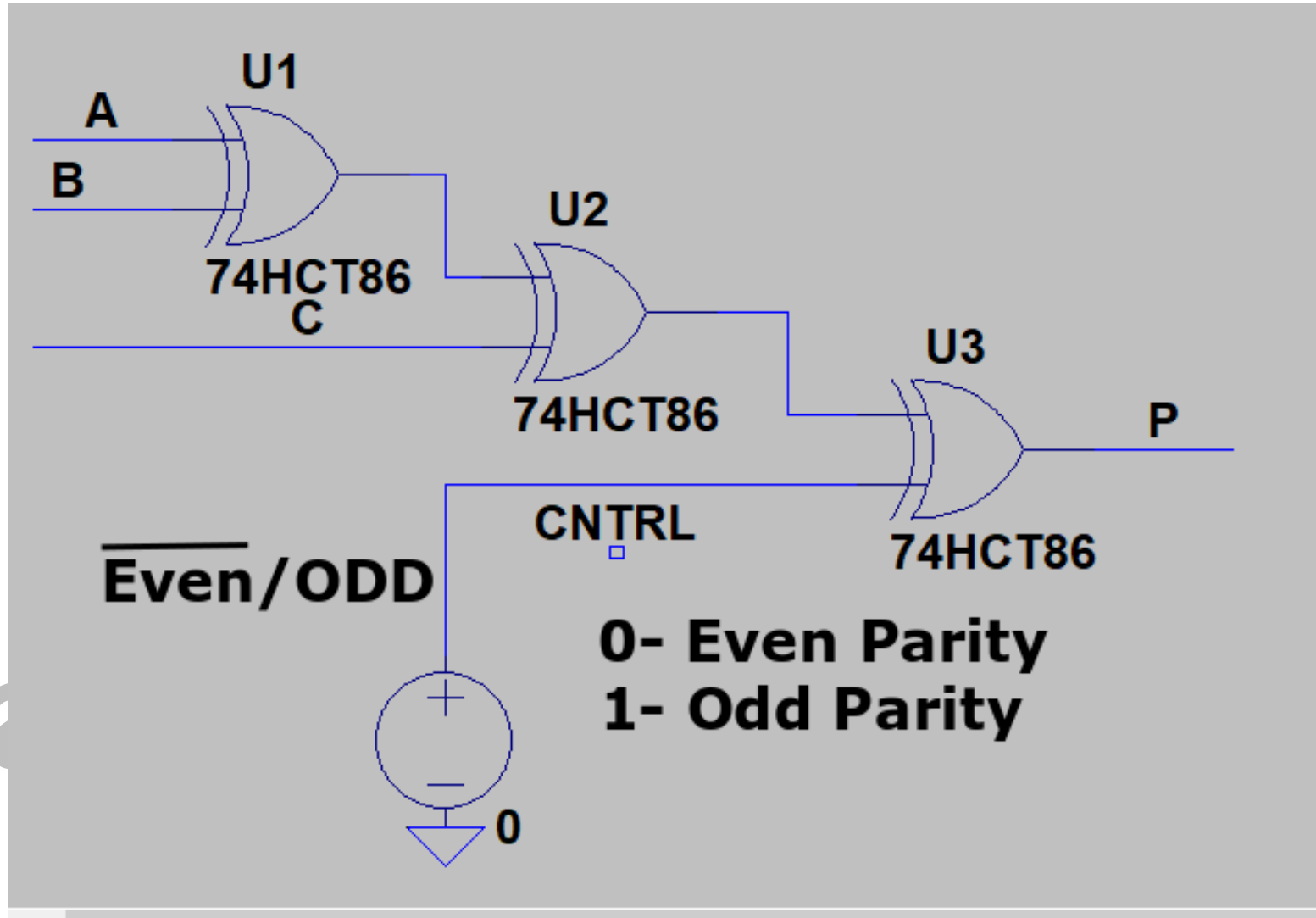


Control	A	F
0	0	0
0	1	1
1	0	1
1	1	0

Pass

Invert

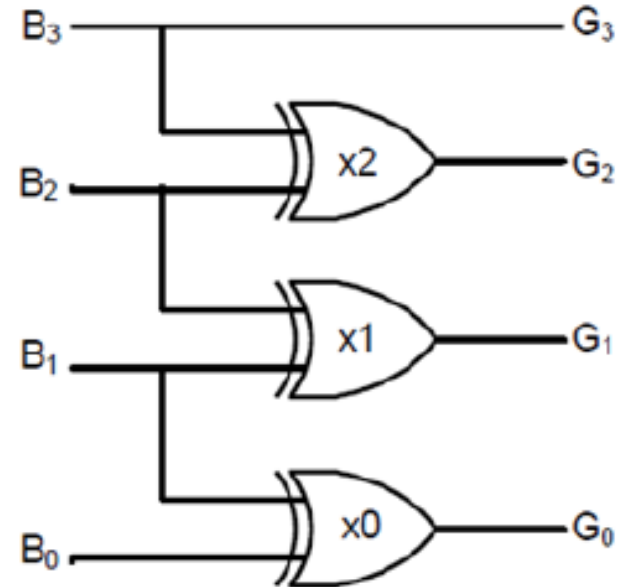
Parity Generator



Binary to Gray Converter

Problem 1: Binary to Gray Converter

Decimal Number	4 bit Binary Number <u>ABCD</u>	4 bit Gray Code <u>G₁G₂G₃G₄</u>
0	0000	0000
1	0001	0001
2	0010	0011
3	0011	0010
4	0100	0110
5	0101	0111
6	0110	0101
7	0111	0100
8	1000	1100
9	1001	1101
10	1010	1111
11	1011	1110
12	1100	1010
13	1101	1011
14	1110	1001
15	1111	1000





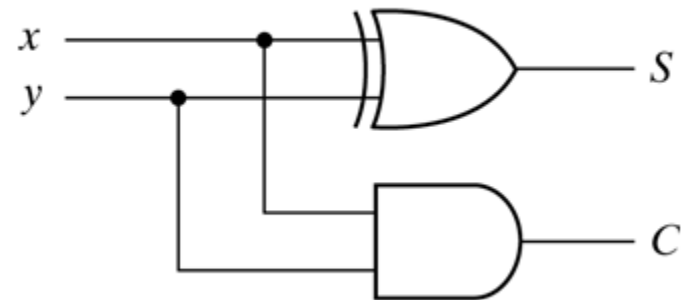
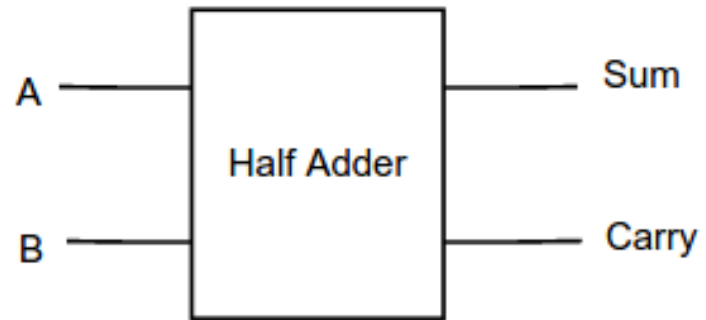
Half Adder

Problem 2: Half Adder

Truth Table

Input		Output	
A	B	Sum	Carry
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

Block Diagram

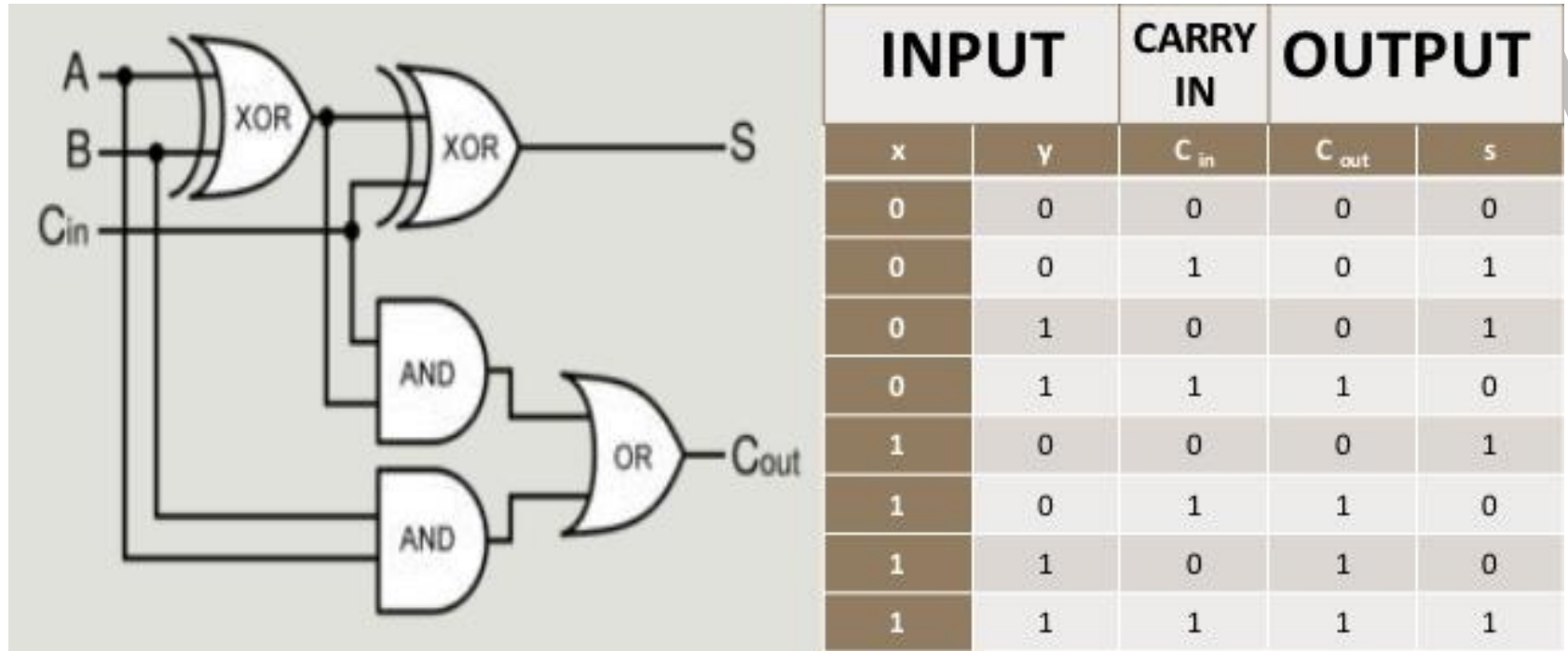


$$Sum(S) = x \oplus y$$

$$Carry(C) = xy$$

Full Adder

Problem 3: Full Adder



FULL ADDER CIRCUIT & TRUTH TABLE



Demonstration