Department of Computer Science and Engineering
BRAC University
CSE 260: Digital Logic Design

Experiment Name:

Experiment # 1: Familiarization with *Fundamental Logic Gates*

Experiment # 2: Universal Gates, Applications of Boolean Algebra

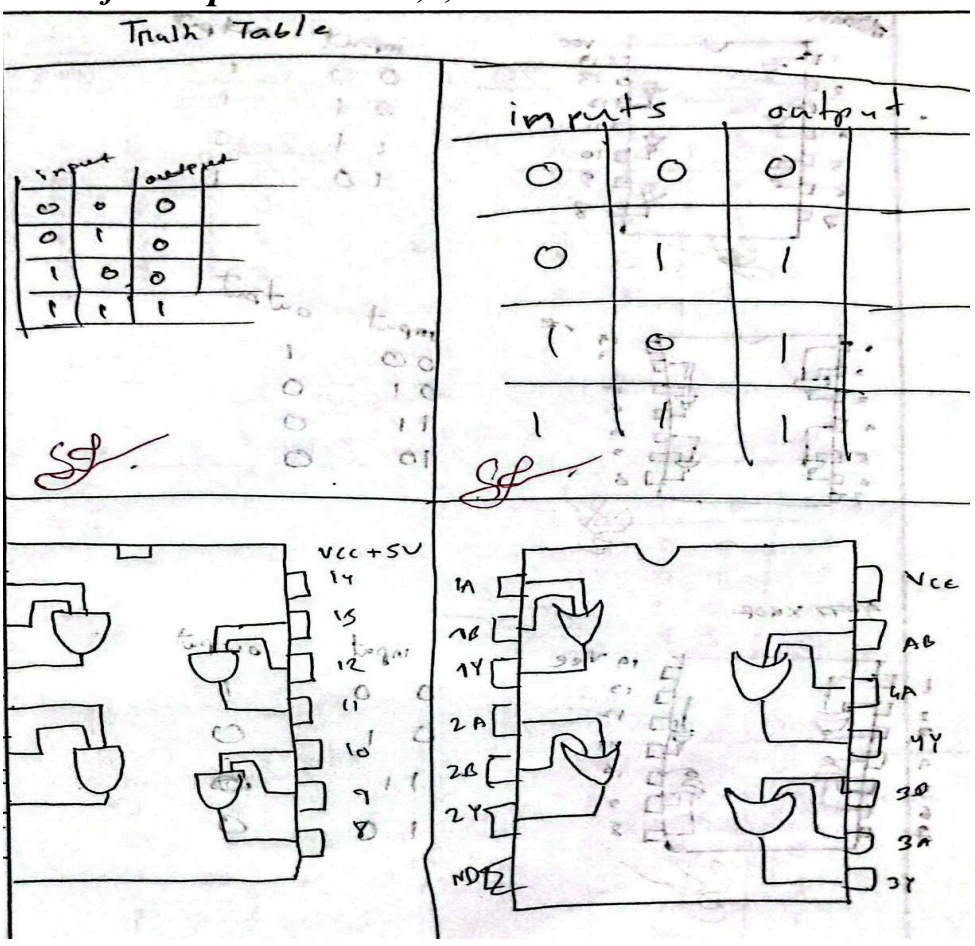
Experiment # 3: Parity Bit Checker and Generator

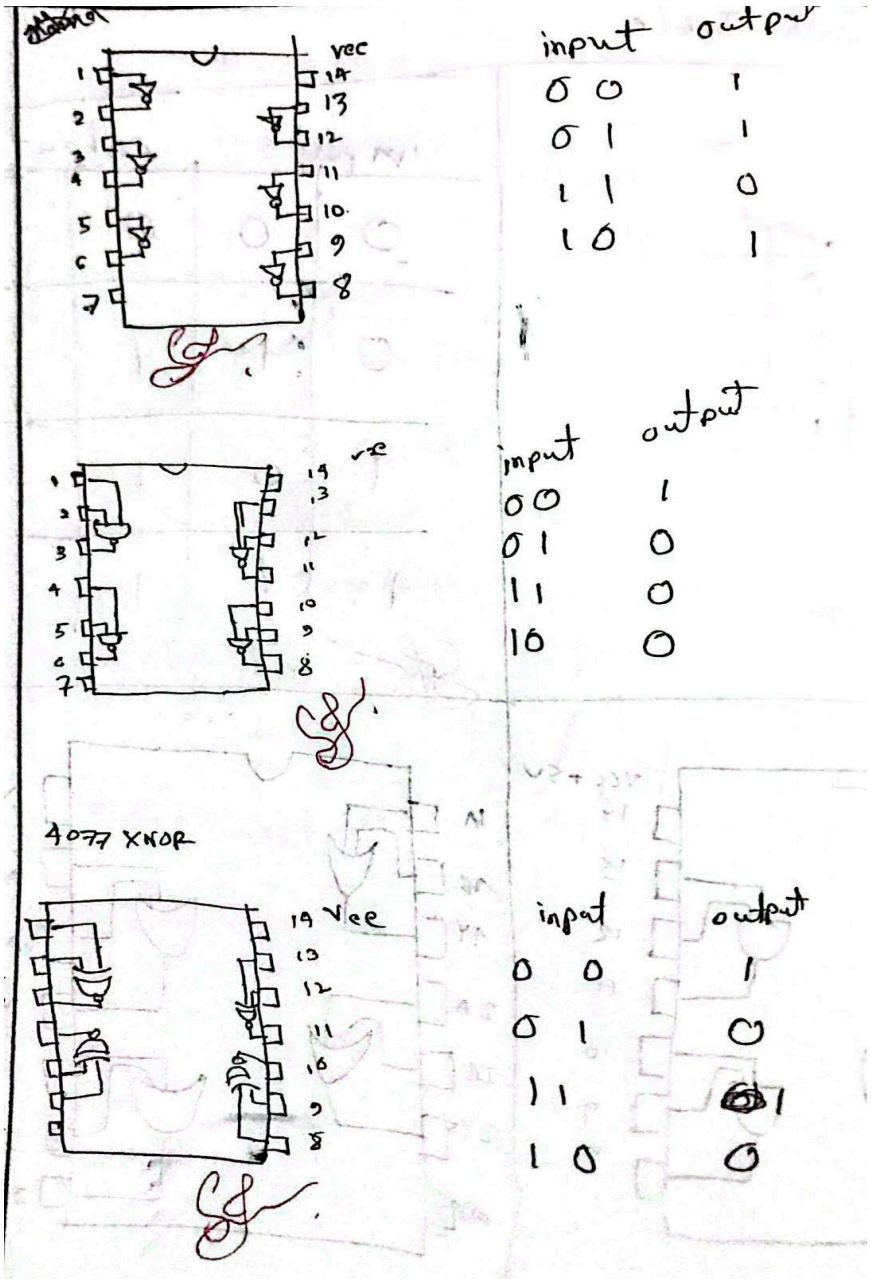
Required Components for Experiment -1,2,3:

1. IC 7408 × 1
2. IC 7432 x 1
3. IC 7404 × 1
4. IC 7400 x 1
5. IC 7402 × 1
6. IC 7486 x 1
7. IC 4077 x 1

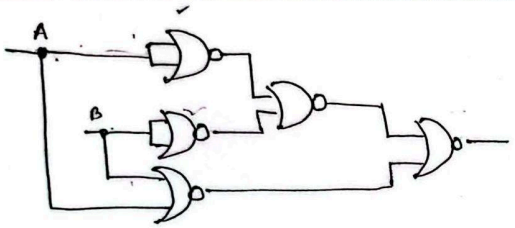
Experimental Setup for Experiment - 1,2,3:

Result for Experiment - 1,2,3:




Vcc
1
2
3
4
5
6
7
14
13
12
11
10
9
8
input output
0 0 1
0 1 1
1 1 0
1 0 1
input output
0 0 1
0 1 0
1 1 0
1 0 0
4077 XNOR
19 Vee
13
12
11
10
9
8
input output
0 0 1
0 1 0
1 1 1
1 0 0

TOPIC NAME : _____ TIME : DATE :



		Output
0	0	0
0	1	1
1	0	1
1	1	0

$$\left(\left((A+A)' + (B+B)' \right)' + (A+B)' \right)'$$

$$= \left((A+A)' + (B+B)' \right)'' \cdot (A+B)''$$

$$= \left((A'.A') + (B'.B') \right) . (A+B)$$

$$= (A'+B') . (A+B)$$

$$= AA' + AB' + A'B + BB'$$

$$= AB' + A'B$$

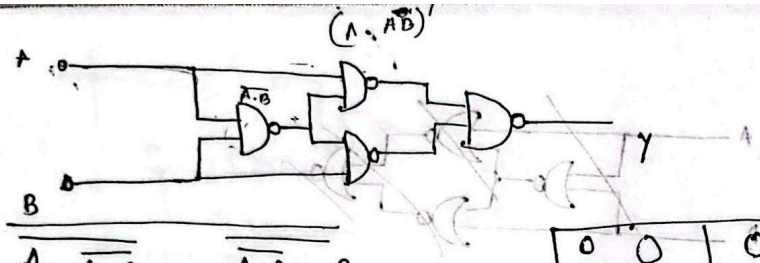
Inputs		output
0	0	0
0	1	1
1	0	1
1	1	0

$(A+B') : A + (A'+B') . B$

$AA' + AB' + A'B + BB'$

$= AB' + A'B.$

Aabran



$\overline{A \cdot \overline{A \cdot B}} \cdot \overline{\overline{A \cdot B} \cdot B}$

0	0	0
0	1	1
1	0	1
1	1	0

$= (A.(A.B)')'' + ((A.B)'.B)''$

$= (A' + A.B) + (AB + B')$

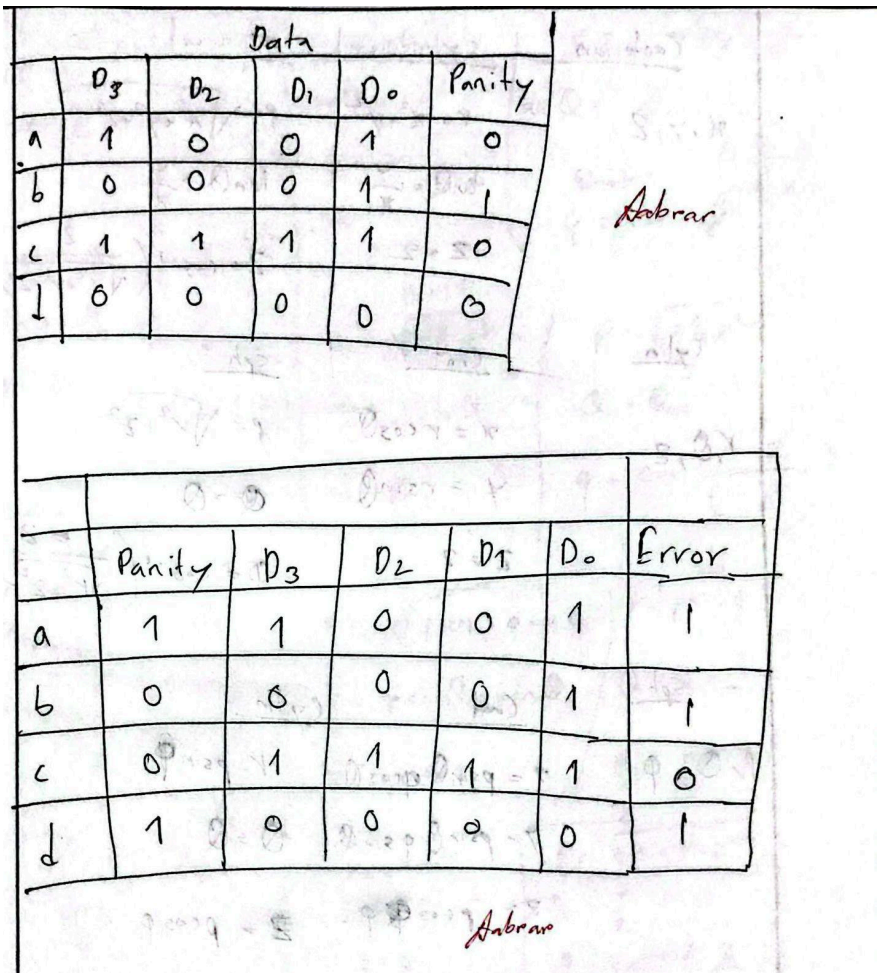
$= \left((A.(AB)')' . [(AB)'.B)' \right)'$

$= (A.(AB)')'' + ((AB)'.B)''$

$= (A.(AB)') + (B.(AB)')$

$= (A(\bar{A}+\bar{B})) + (B.(\bar{A}+\bar{B}))$

$= A\bar{B} + \bar{A}B$



	Data				
	D_3	D_2	D_1	D_0	Parity
a	1	0	0	1	0
b	0	0	0	1	1
c	1	1	1	1	0
d	0	0	0	0	0

Asbrar

	Parity	D_3	D_2	D_1	D_0	Error
a	1	1	0	0	1	1
b	0	0	0	0	1	1
c	0	1	1	1	1	0
d	1	0	0	0	0	1

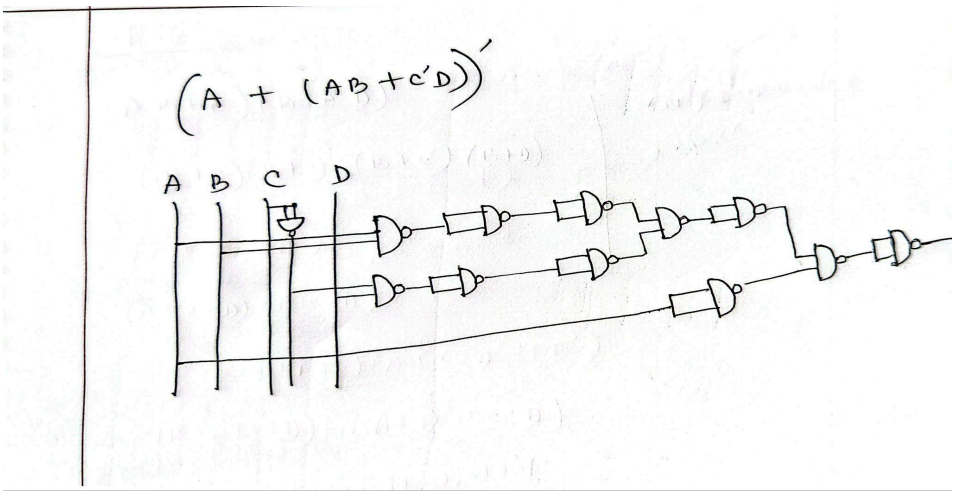
Asbrar

Answer the following questions also as part of discussion:

1. Implement the following function using NAND gate only: (A+(AB+C'D))'. Do not simplify the function. Draw the circuit diagram only.

2. Draw the circuit diagrams of 3-bit parity checker and generator using NOR gate(s) only

[1]



[2]