CSE260 Lab Report

Experiment Name: Applications of Boolean algebra

Submitted by

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Section: 09

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1. Name of the experiment :

Application of Boolean Algebra.

2. Objective:-

i) To investigate the rules of Boolean Algebra.

ii) To gain experience working with partial circuits.

iii) To simplify a complex function using Boolean Algebra.

3. Required Components and Equipments :

i) Proteus 8° Professional.

ii) NAND

iii) LOGIC STATE (BIG)

iv) LOGIC PROBE

v) Ground

vi) LED- Green

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4. Experimental Setup :

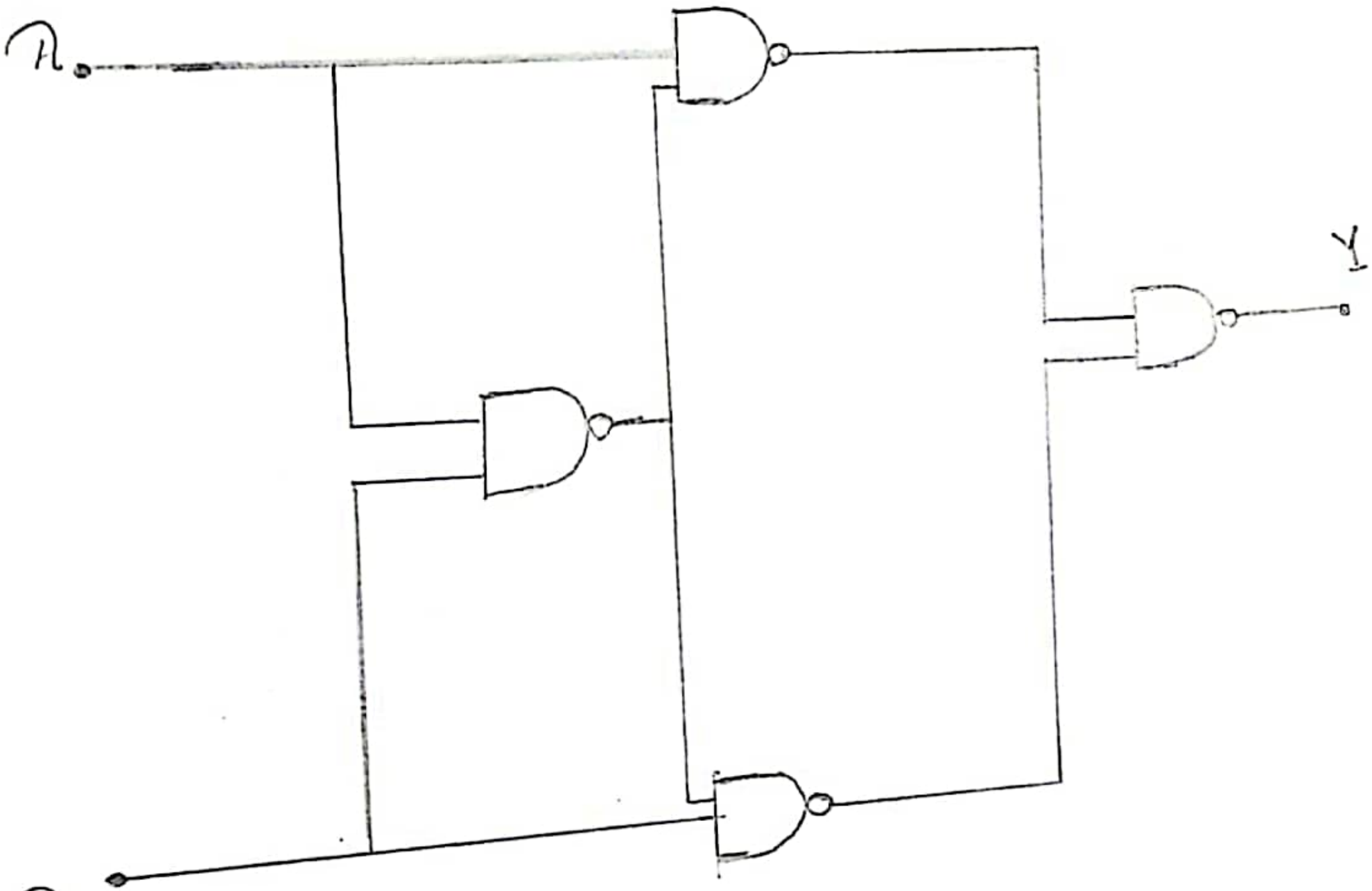

Figure: IC Configuration

P.T.O

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5. Result:- (Truth table:-)

A	B	$\overline{AB}$	$A.\overline{AB}$	$\overline{A.\overline{AB}}$	$B.\overline{AB}$	$\overline{B.\overline{AB}}$	$\overline{(A+\overline{AB}).(\overline{B.\overline{AB}})}$	$A \oplus B$
0	0	1	0	1	0	1	0	0
0	1	1	0	1	1	0	1	1
1	0	1	1	0	0	1	1	1
1	1	0	0	1	0	1	0	0

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Discussions:

The output is: $\overline{(\overline{A.A\overline{B}}).(\overline{B.A\overline{B}})}$

Here,

$$Y = \overline{(\overline{A.A\overline{B}}).(\overline{B.A\overline{B}})}$$

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

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

$$= \overline{A\overline{B}}(A+B)$$

$$= (\overline{A}+\overline{\overline{B}})(A+B)$$

$$= A.\overline{A} + B\overline{A} + A\overline{B} + B\overline{B}$$

$$= 0 + \overline{A}B + 0 + A\overline{B}$$

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

$$= A \oplus B$$

Upon further examination, we can see that circuit function is equal to a single gate, which is referred to as the X-OR gate once it has been simplified.

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