Section and Group No:

Name:

Signature:

EXP #3: COMBINATIONAL CIRCUITS

Equipment will be ensured by the students: NAND gates

Objective(s):

In this experiment, you will design, construct, and test combinational logic circuit which will be constructed with NAND gates.

Preliminary Work:

Design a combinational circuit with four inputs — *A*, *B*, *C*, and *D* — and one output, *F*. *F* is to be equal to 1 when *A* = 1, provided that *B* = 0, or when *B* = 1, provided that either *C* or *D* is also equal to 1. Otherwise, the output is to be equal to 0.

1. Obtain the truth table of the circuit.

A	***B***	***C***	***D***	***F***
0	0	0	0	
0	0	0	1	
0	0	1	0	
0	0	1	1	
0	1	0	0	
0	1	0	1	
0	1	1	0	
0	1	1	1	
1	0	0	0	
1	0	0	1	
1	0	1	0	
1	0	1	1	
1	1	0	0	
1	1	0	1	
1	1	1	0	
1	1	1	1	

2. Simplify the output function.

3. Draw the logic diagram of the circuit, using NAND gates with a minimum number of ICs.

Laboratory Work:

Construct the circuit you implemented at your preliminary work and test it for proper operation by verifying the given conditions.