Section and Group No:

Name:

Signature:

EXP #2: SIMPLIFICATION OF BOOLEAN FUNCTIONS

Objective(s):

This experiment demonstrates the relationship between a Boolean function and the corresponding logic diagram. The Boolean functions are simplified by using the basic identities of Boolean Algebra, as discussed in Chapter 2.

The gate ICs to be used for the logic diagrams are those from Fig. 9.1 which contain the following gates: 7404 inverter, 7408 two-input AND, 7432 two-input OR gate

Preliminary Work:

1. Determine the Boolean Functions of the C, D, E, F and G nodes for the circuit given in Figure 1.

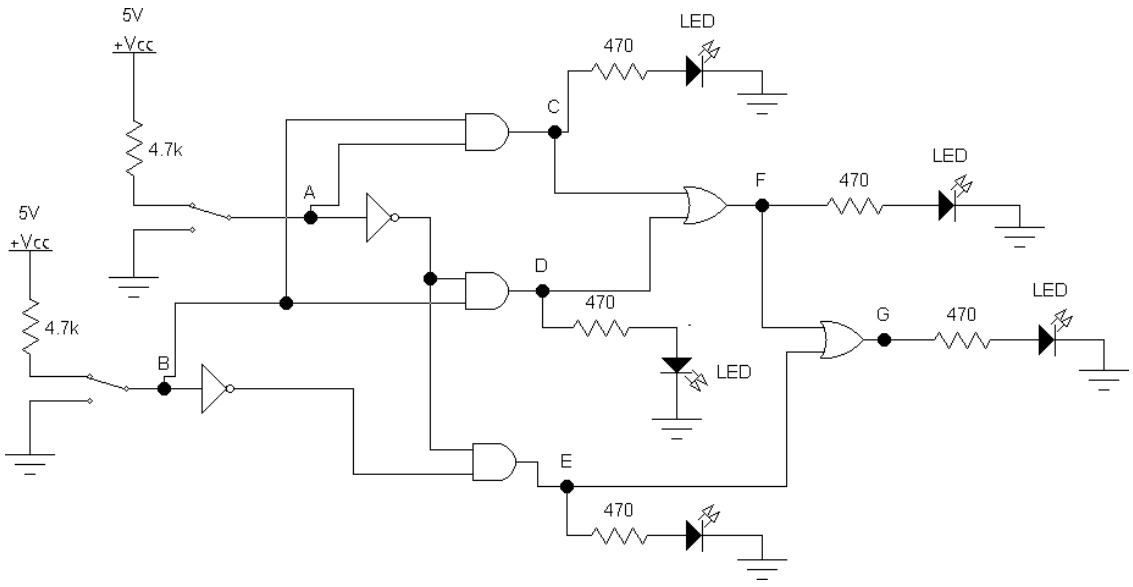


Figure 1

C →

D →

E →

F →

G →

2. Calculate the truth table of this circuit and fill in Table 1.

A	B	A'	B'	C	D	E	F	G
0	**0**							
0	**1**							
1	**0**							
1	**1**							

Table 1

3. Simplify the output of this circuit (node G) by using basic identities of Boolean Algebra and plot the simplified circuit.

4. Calculate the truth table of this simplified circuit and fill in Table 2.

A	B	G
0	**0**	
0	**1**	
1	**0**	
1	**1**	

Table 2

Laboratory Work:

1. Construct the circuit given in Figure 1. Do not forget to supply 5V and ground to IC's.

2. Turn on the power and observe the output of the circuit. Properly connect all the LED's and fill in Table 3 for all possible combinations of inputs.

A	B	A'	B'	C	D	E	F	G
0	**0**							
0	**1**							
1	**0**							
1	**1**							

Table 3

3. According to your preliminary work, construct the simplified version of the circuit given in Fig. 1. Apply all input combinations and fill the results in Table 4.

A	B	G
0	**0**	
0	**1**	
1	**0**	
1	**1**	

Table 4

4. Compare the results of these two circuits. Are they the same?