

VERIFICATION OF GATES

Aim: - To study and verify the truth table of logic gates

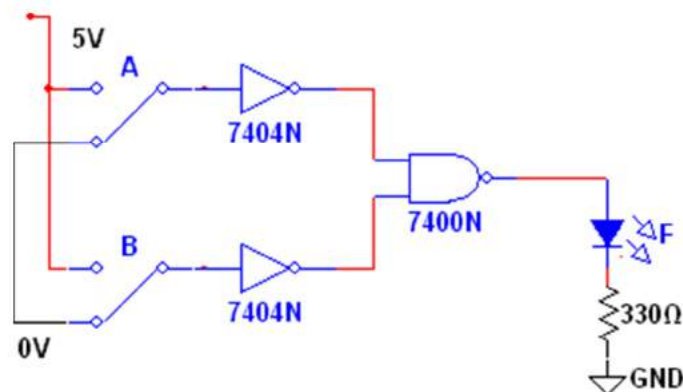
Apparatus Required: -

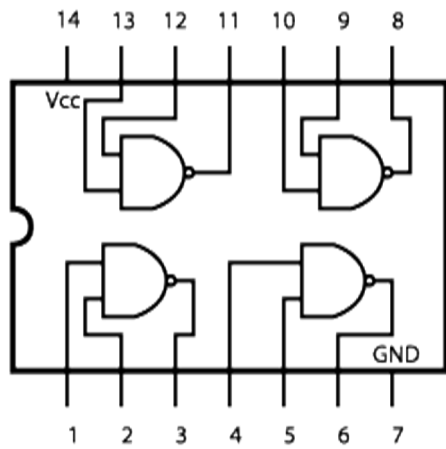
All the basic gates mention in the fig.

74LS00,74LS02,74LS04,74LS08,74LS32,74LS86

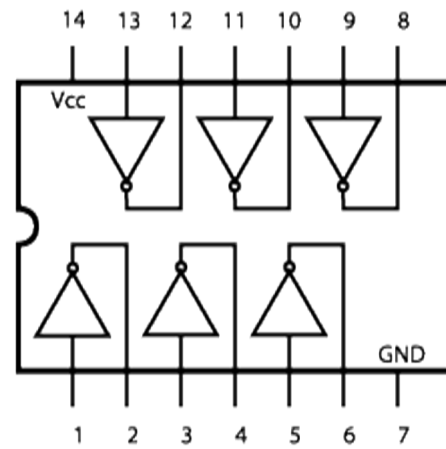
Procedure: -

1. Place the IC on IC Trainer Kit.
2. Connect V_{CC} and ground to respective pins of IC Trainer Kit.
3. Connect the inputs to the input switches provided in the IC Trainer Kit.
4. Connect the outputs to the switches of O/P LEDs,
5. Apply various combinations of inputs according to the truth table and observe condition of LEDs.
6. Disconnect output from the LEDs and note down the corresponding multimeter voltage readings for various combinations of inputs.

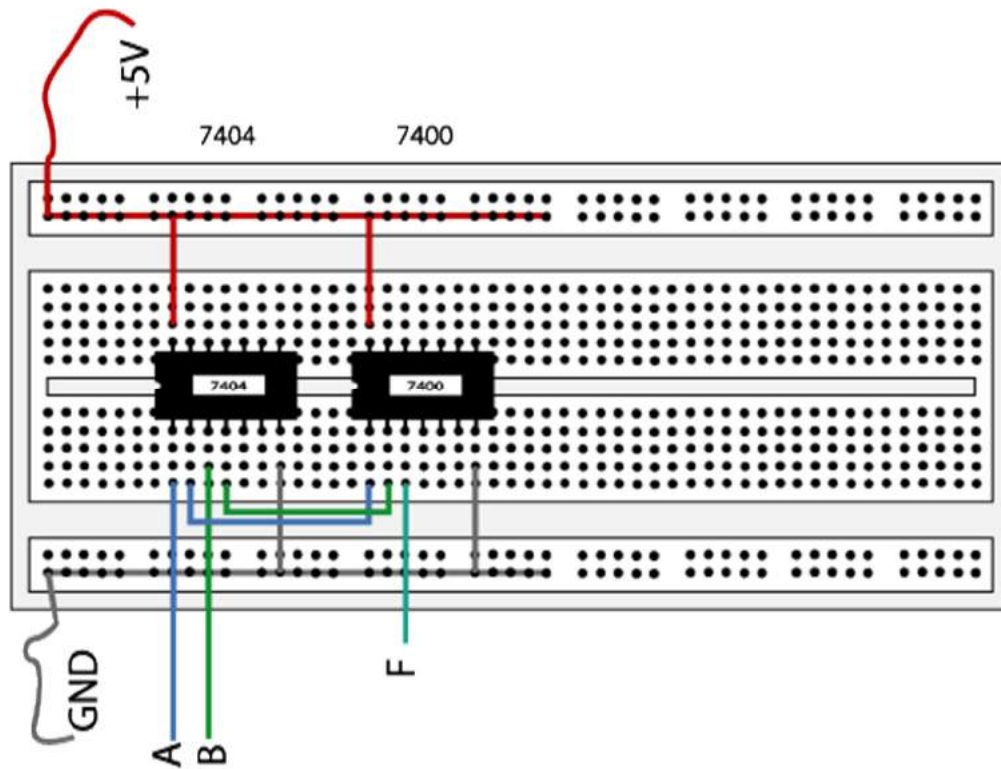




Quad 2 Input 7400



Hex 7404 Inverter



AND Gate Implementation

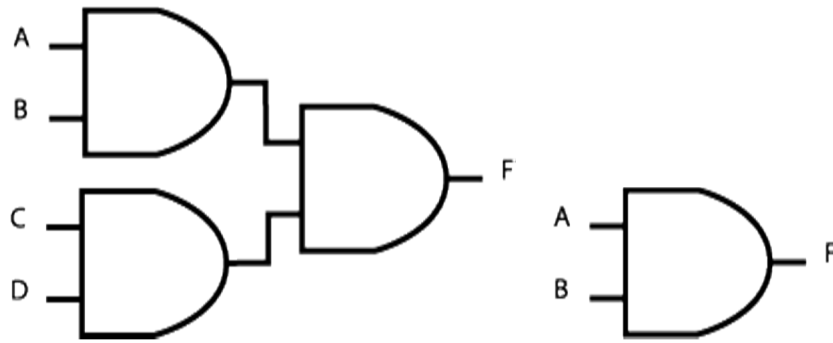


Figure 1. The 2-input AND gate

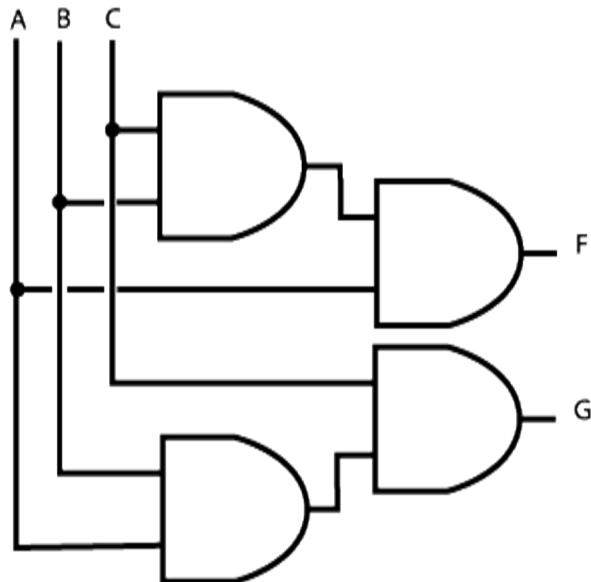
Figure 2. The 4-input AND gate, built using 2-input AND gates.

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	

A	B	F	V (actual voltage)
0	0		
0	1		
1	0		
1	1		

Associative and Commutative Laws

A	B	C	F	G
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		



Proving The Associative Law.

Laws of Boolean Algebra

(a) To demonstrate the Distributive law, connect AND, OR gates as shown in Figure 4. Vary the inputs A, B and C to obtain all possible combinations and check that the outputs F and G are identical.

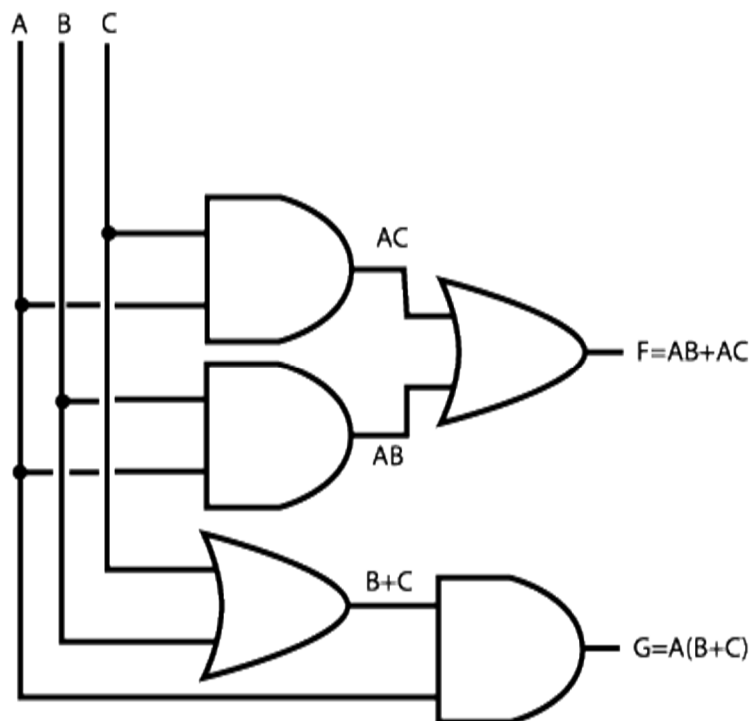


Figure 4. The Distributive Law.

Give the outputs in a truth table as shown below:

A	B	C	F	G
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Disconnected Inputs

(a) Check the behaviour of an OR gate when one of its inputs is open (disconnected - not connected to ground). Check the behaviour when two of the inputs are open. Describe what you observed. Do the same for an AND gate.