

Department of Electrical Engineering

Faculty Member: NASIR MEHMOD

Dated: 2/13/2023

Semester: 2

Section: BESE 13 A

Group No.:

EE122 Computer Architecture and Logic Design

Lab No 2 : Digital Design of Simple Practical Circuits

Name	Reg. No	PLO4/CLO4 Viva / Lab Performance 5 Marks	PLO4/CLO 4 Analysis of data in Lab Report 5 Marks	PLO5/CLO 5 Modern Tool Usage 5 Marks	PLO8/CLO 6 Ethics and Safety 5 Marks	PLO9/CLO 7 Individual and Team Work 5 Marks	Total marks Obtained 25 Marks
Abdul Moiz	419516						
Faiq Qazi	406483						

Task 1

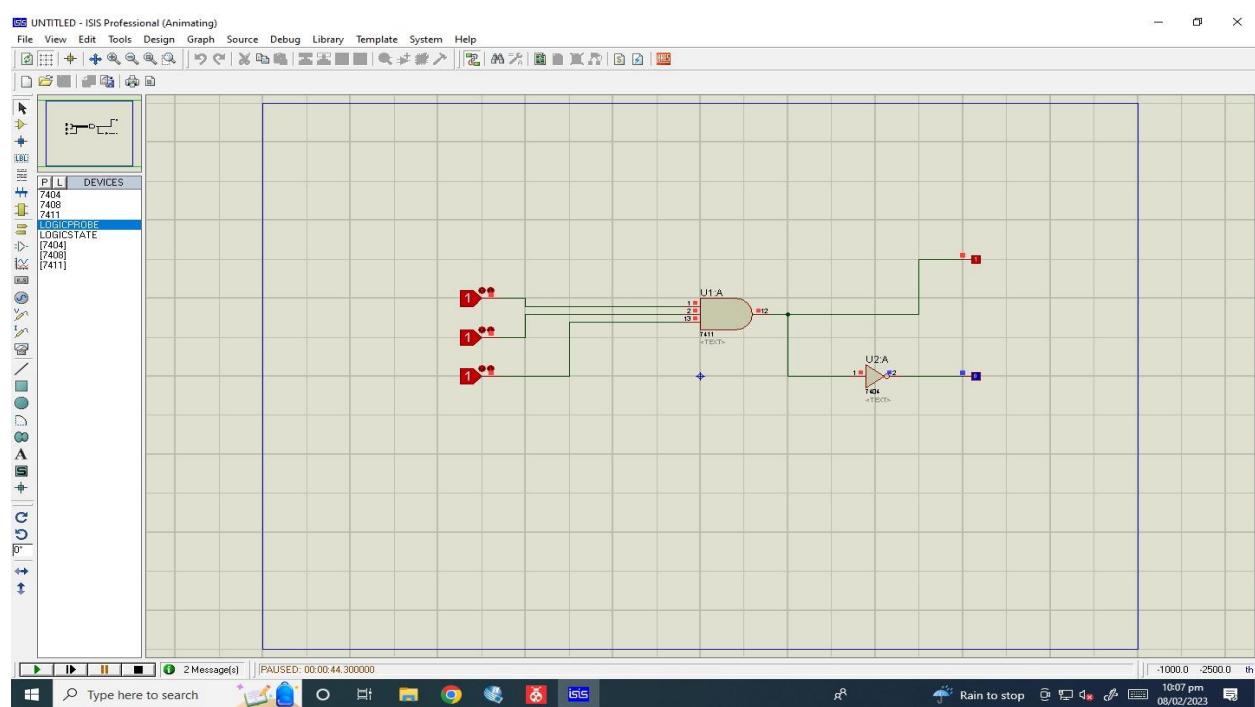
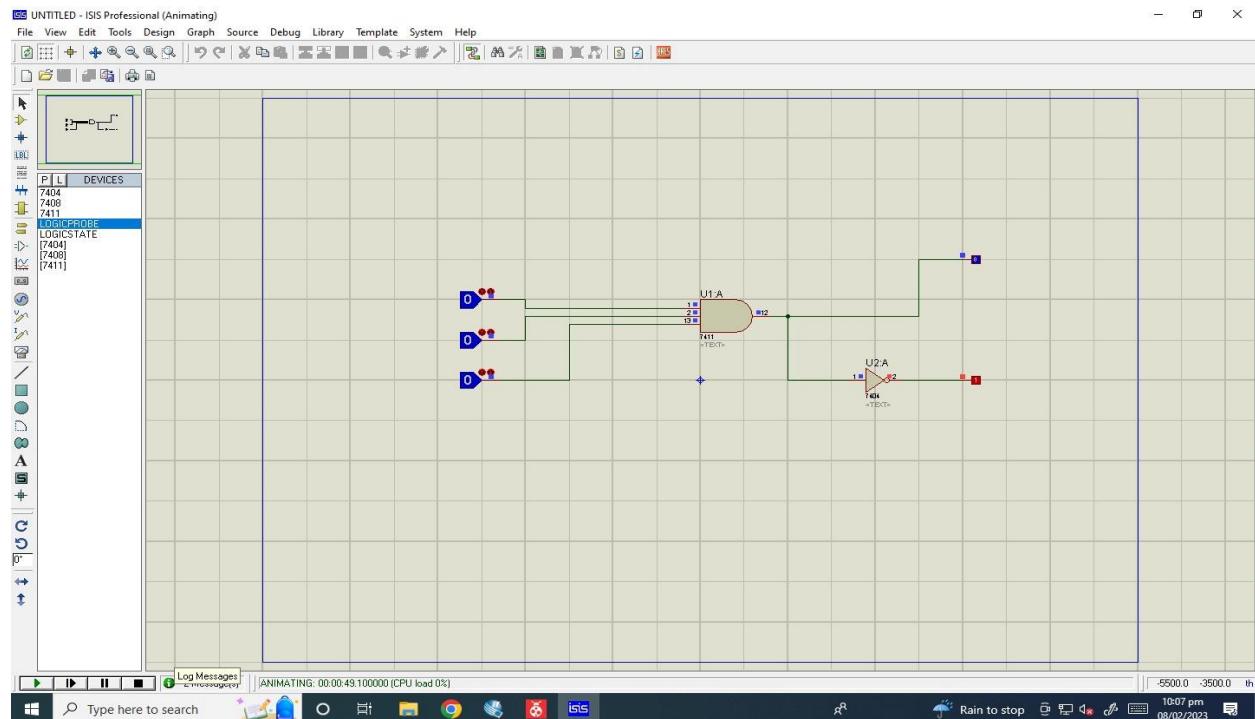
Procedure

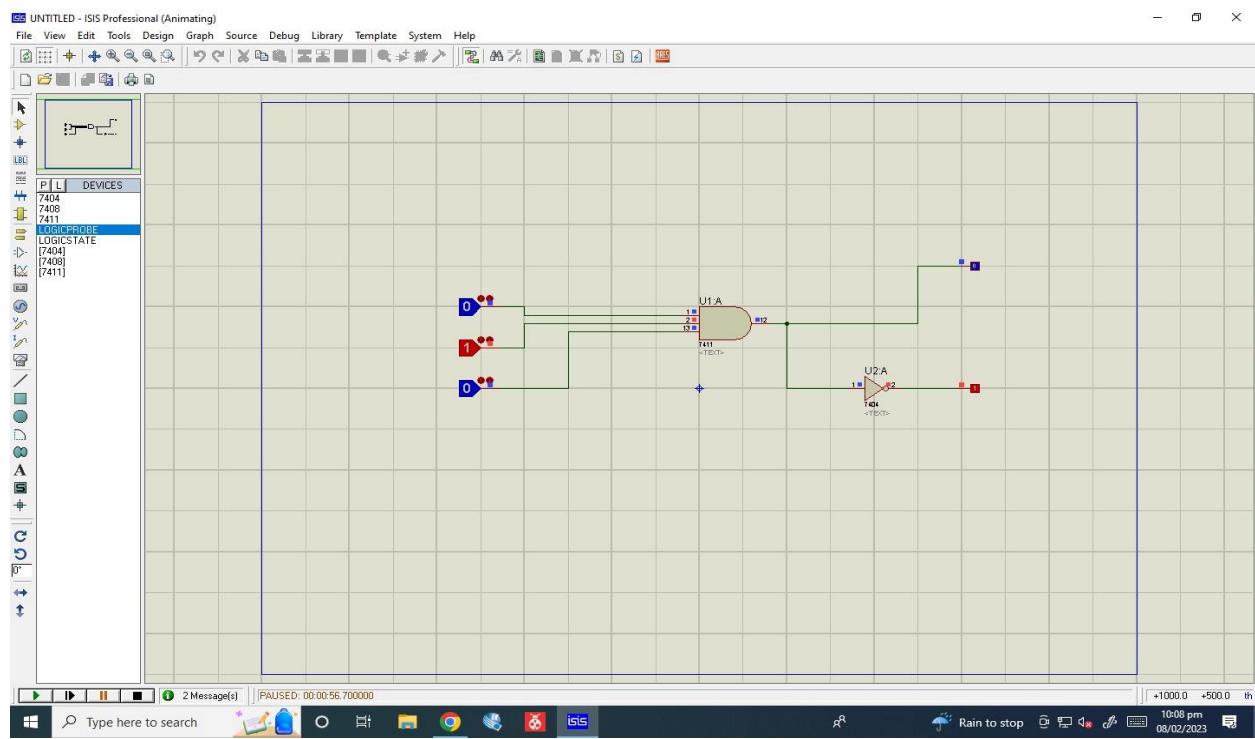
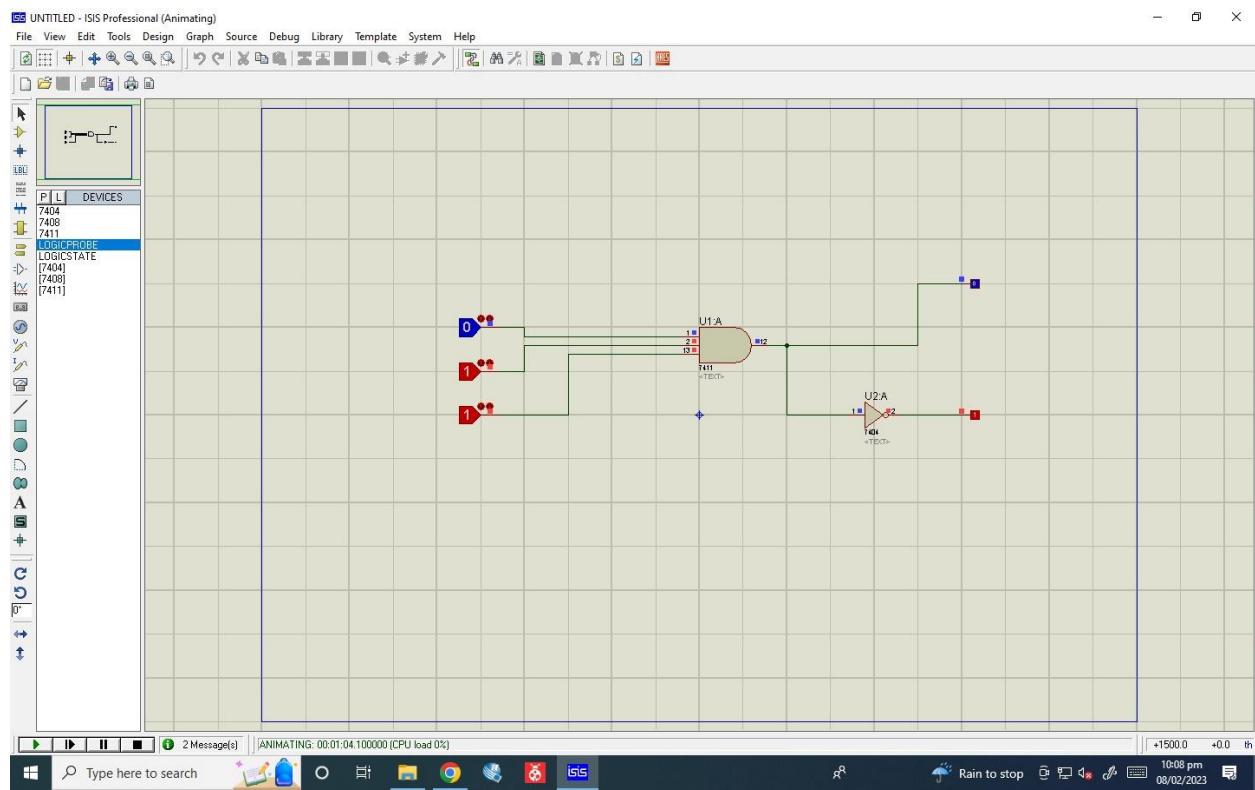
1. Make sure the trainer board is switched off while you are patching the circuit.
2. Make a neat schematic diagram clearly mentioning the IC numbers, PIN configurations and connections between different ICs.
3. Place the IC(s) such that the Notch is towards the left.
4. Provide the ground connection(s) by connecting the GND pin(s) of the IC(s) to 0 V on your trainer board power supply with the help of jumping wires. Make sure that all the ICs are properly grounded.
5. Provide the VDD or operating voltage to each IC by connecting its VDD (or VCC) terminal to +5V on your trainer board power supply.
6. Patch the circuit as per the schematic.
7. Connect the output to the output leds
8. Now switch on the trainer board and provide the inputs
9. Observe the outputs and write them down on the truth table

Truth table

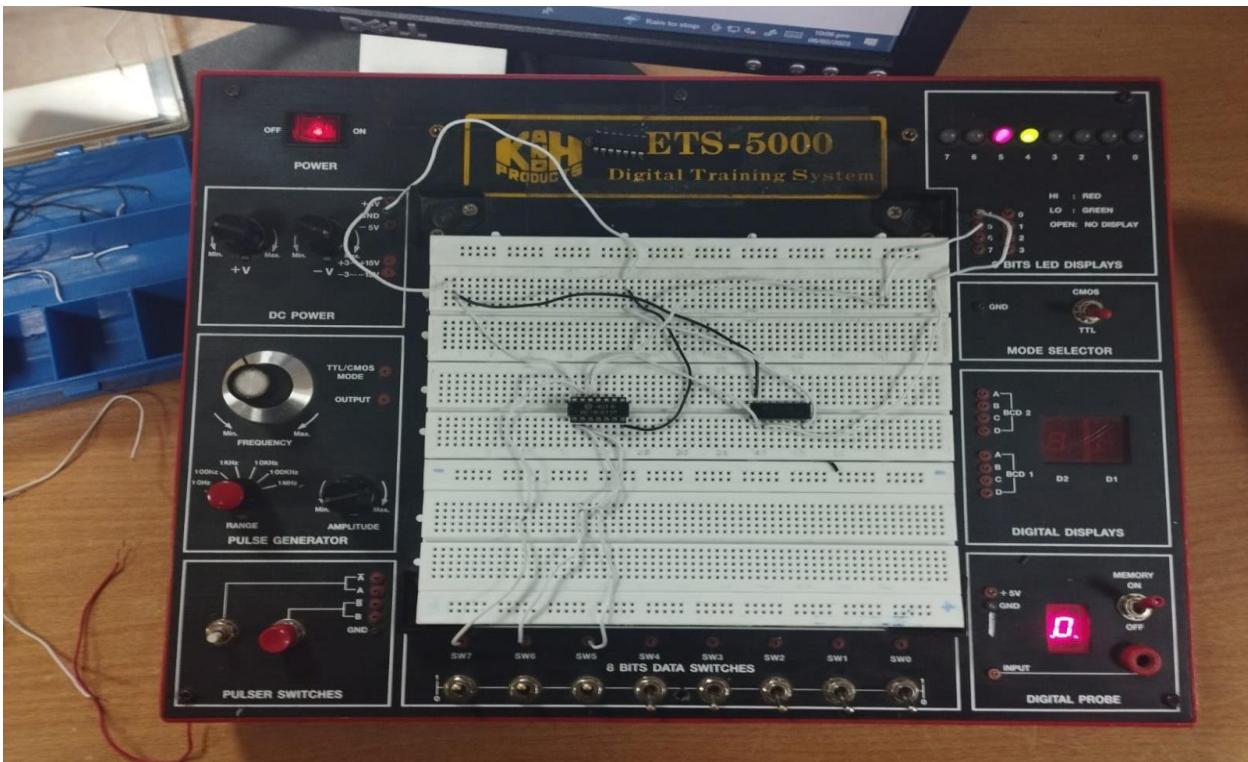
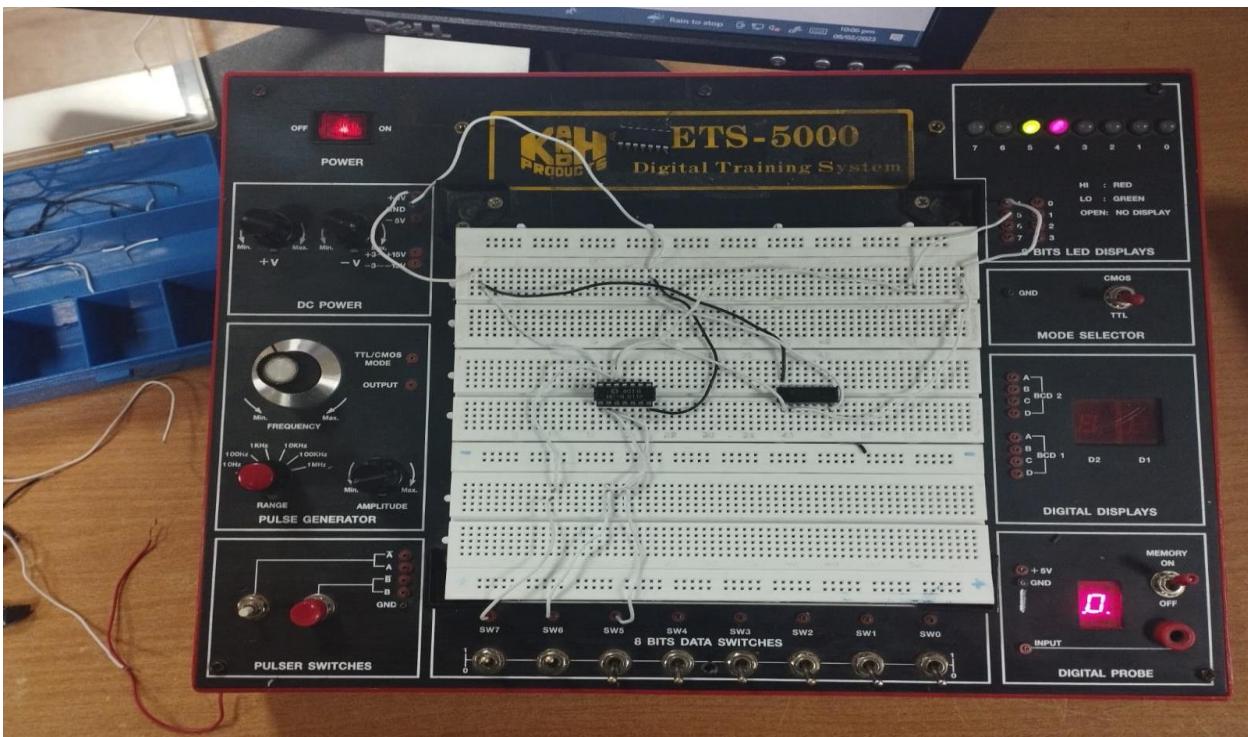
A	B	C	F	G
0	0	0	0	1
0	0	1	0	1
0	1	0	0	1
0	1	1	0	1
1	0	0	0	1
1	0	1	0	1
1	1	0	0	1
1	1	1	1	0

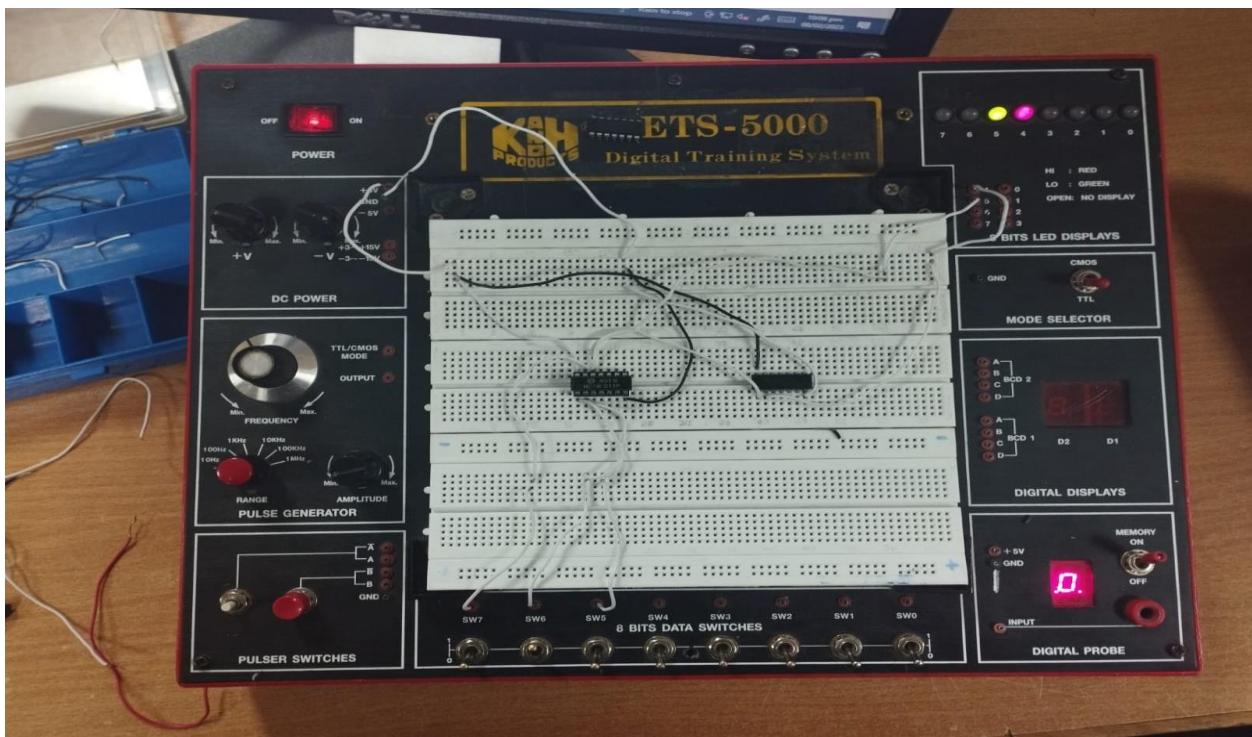
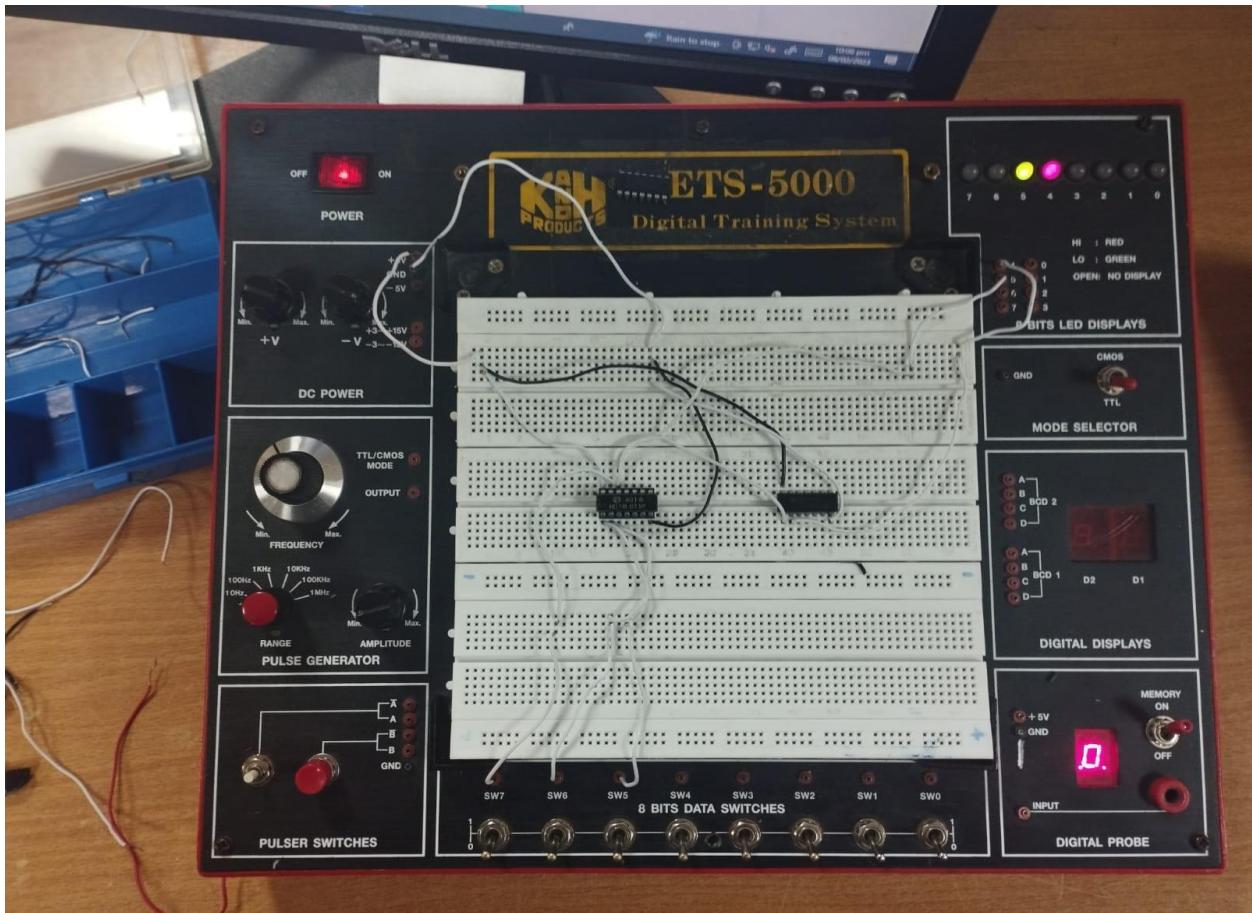
Proteus





Hardware





Task 2

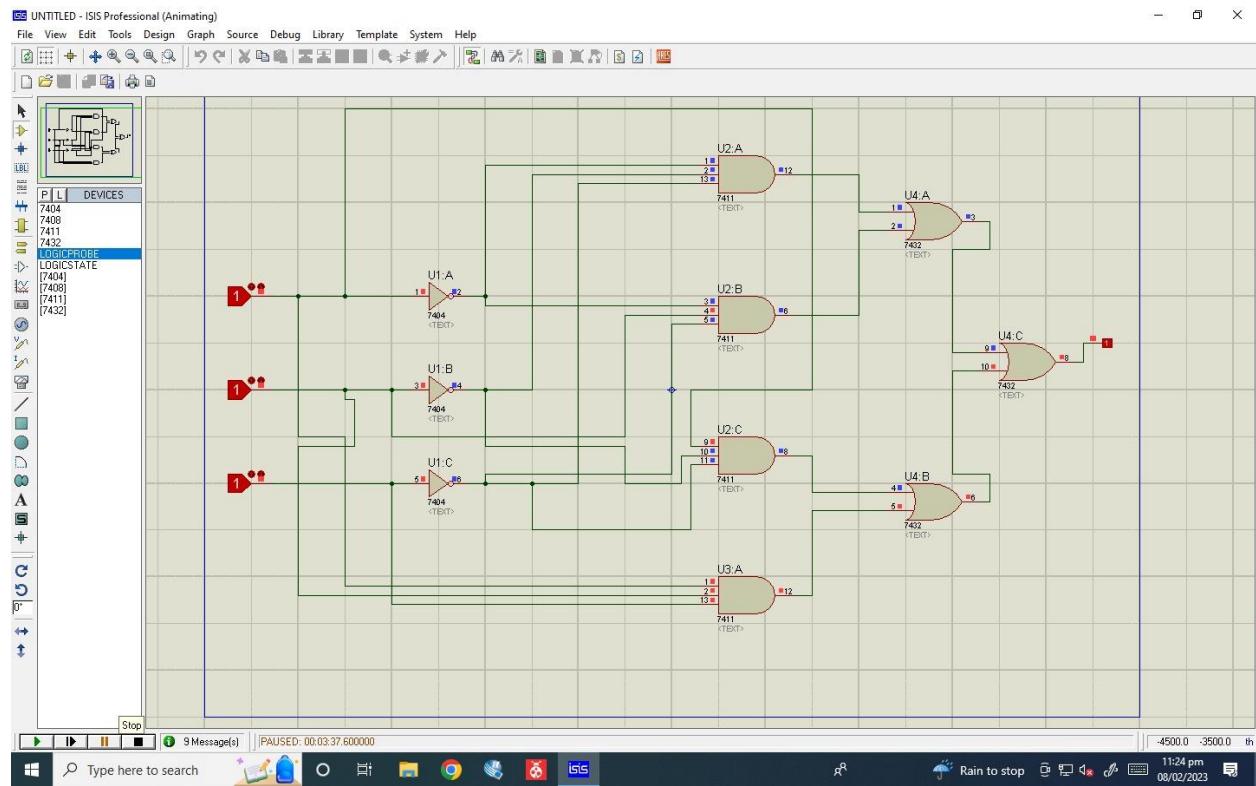
Procedure

10. Make sure the trainer board is switched off while you are patching the circuit.
11. Make a neat schematic diagram clearly mentioning the IC numbers, PIN configurations and connections between different ICs.
12. Place the IC(s) such that the Notch is towards the left.
13. Provide the ground connection(s) by connecting the GND pin(s) of the IC(s) to 0 V on your trainer board power supply with the help of jumping wires. Make sure that all the ICs are properly grounded.
14. Provide the VDD or operating voltage to each IC by connecting its VDD (or VCC) terminal to +5V on your trainer board power supply.
15. Patch the circuit as per the schematic.
16. Connect the output to the output leds
17. Now switch on the trainer board and provide the inputs
18. Observe the outputs and write them down on the truth table

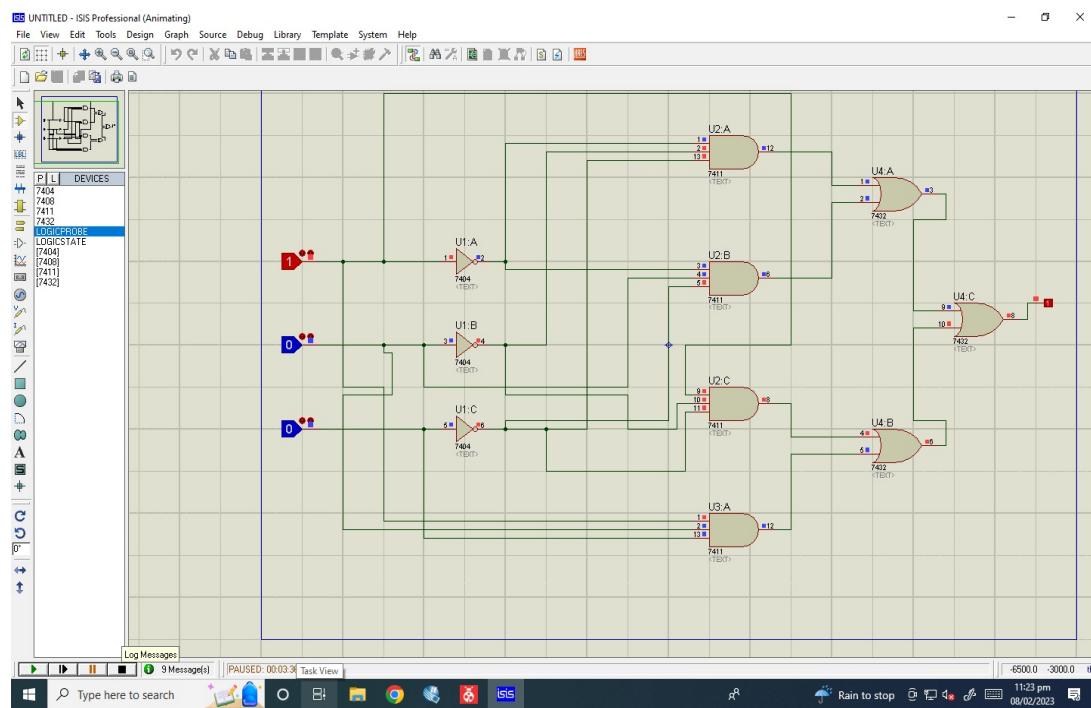
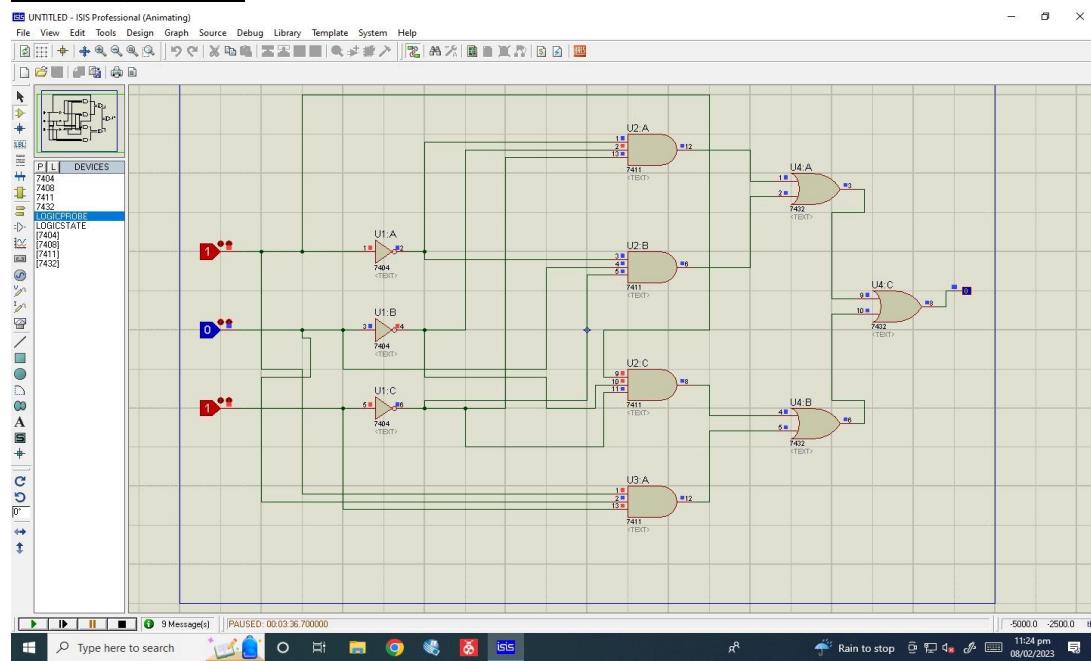
Truth table

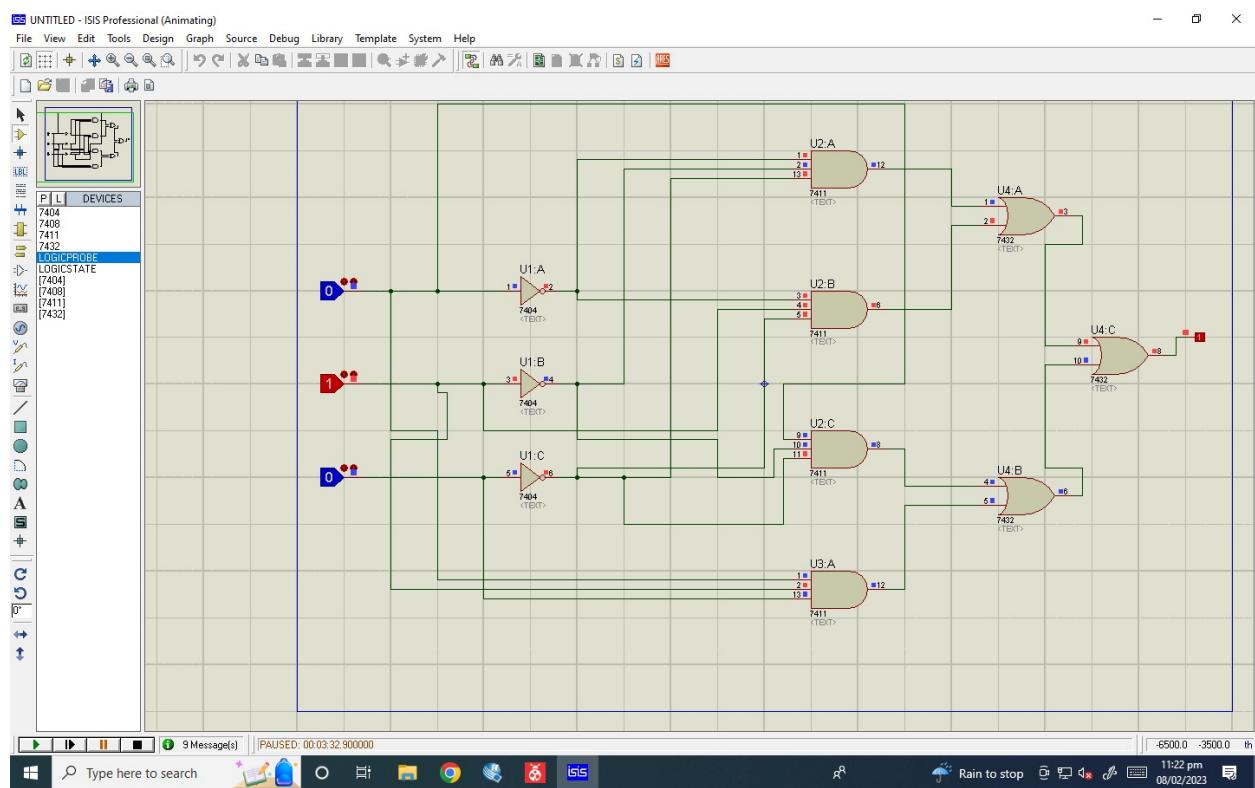
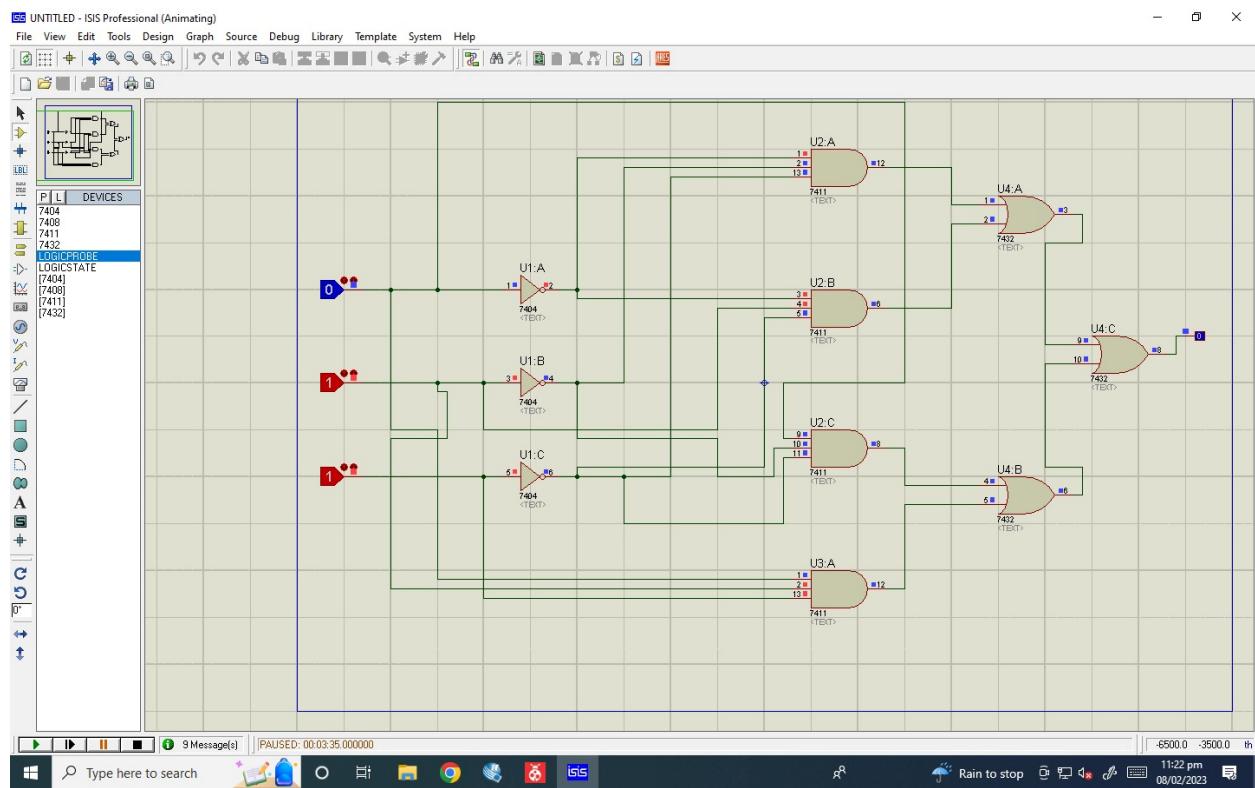
A	B	C	Out PUT
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Proteus

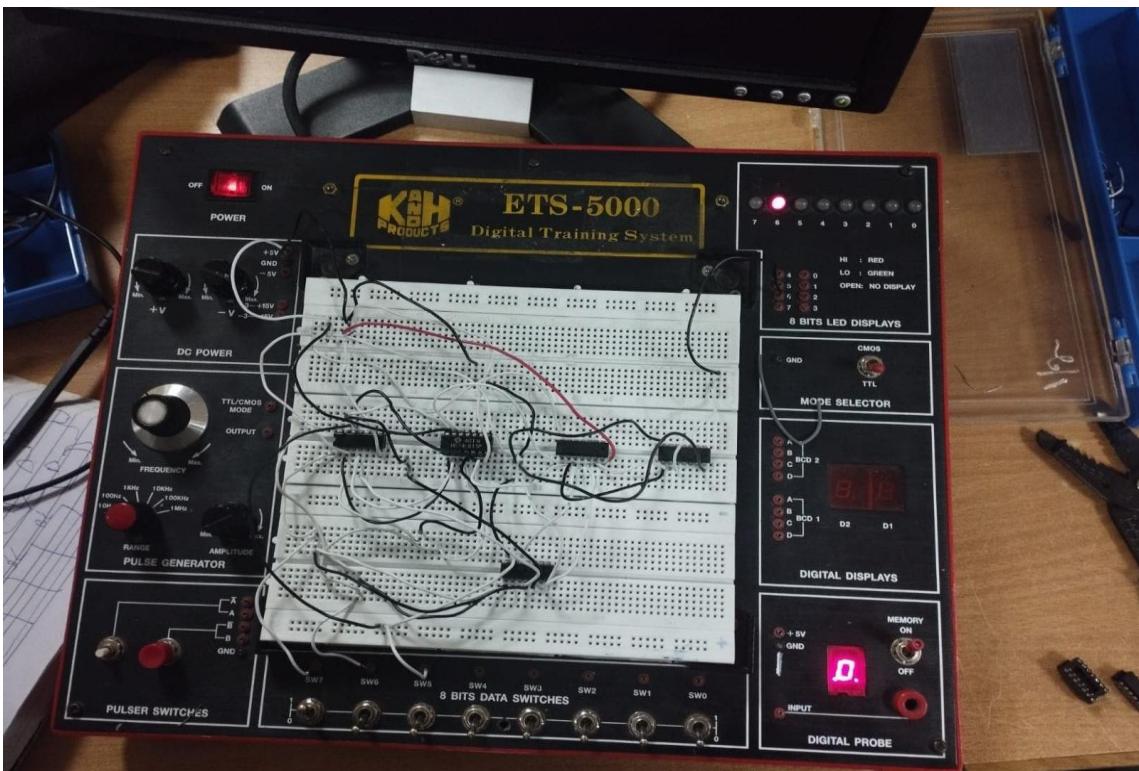
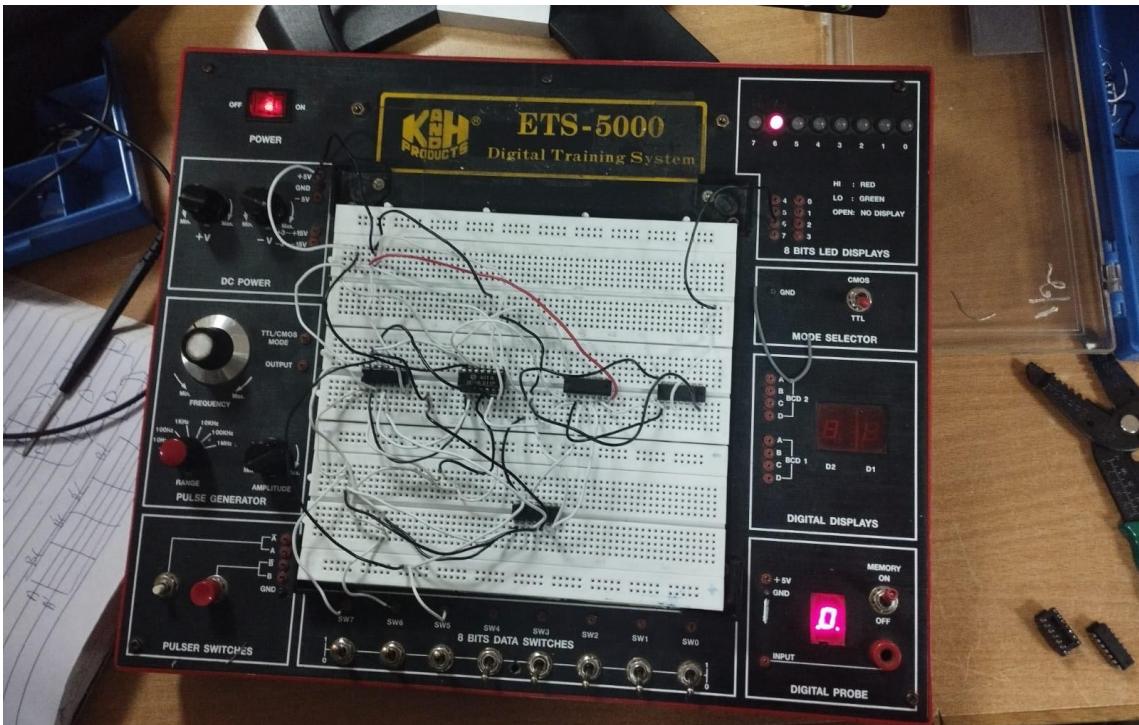


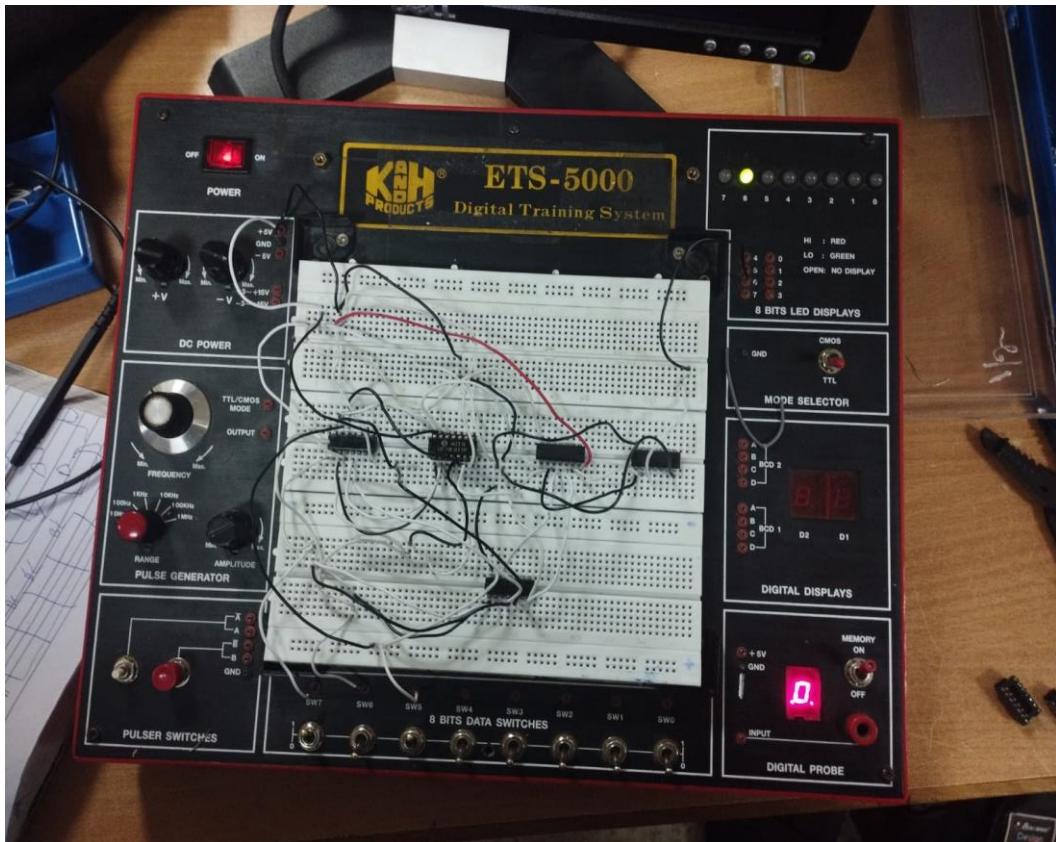
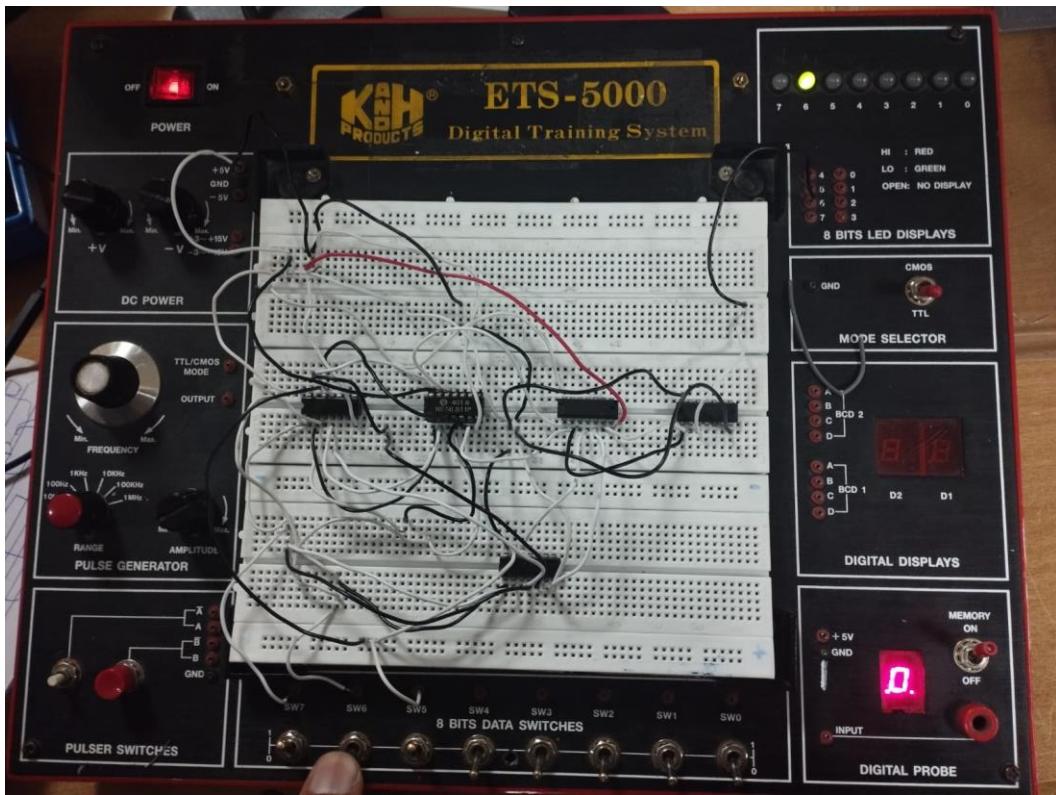
Outputs

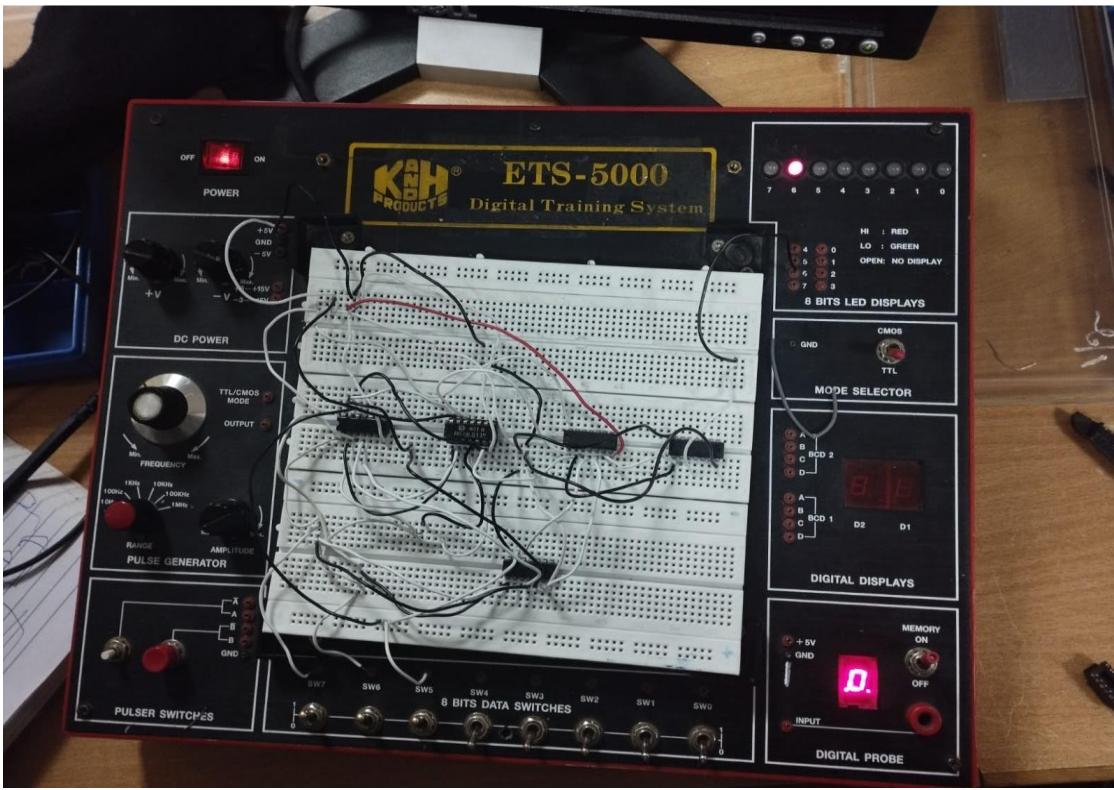
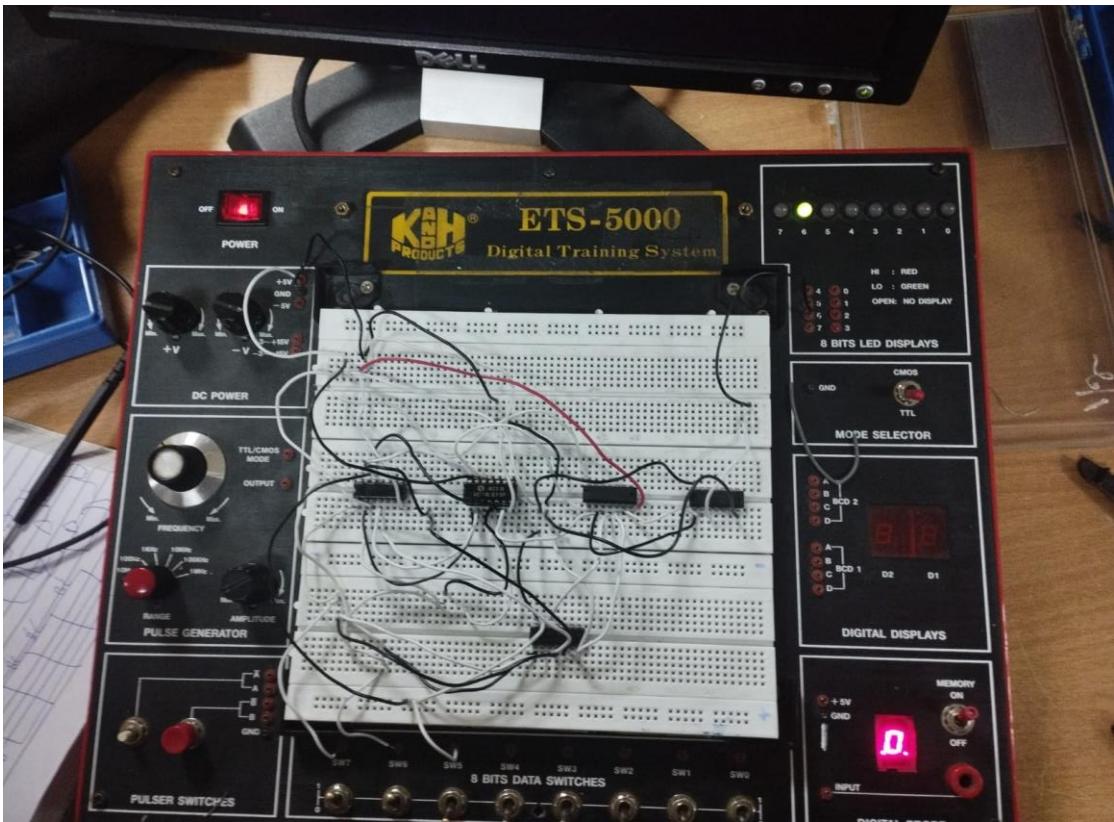


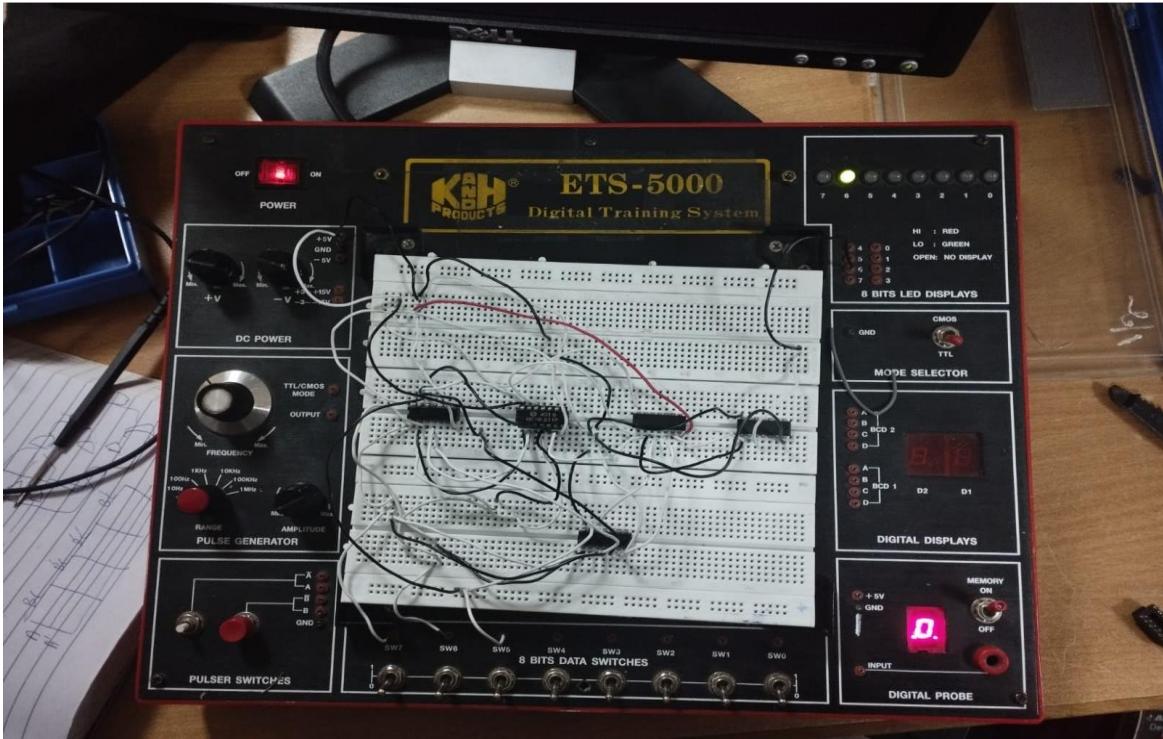
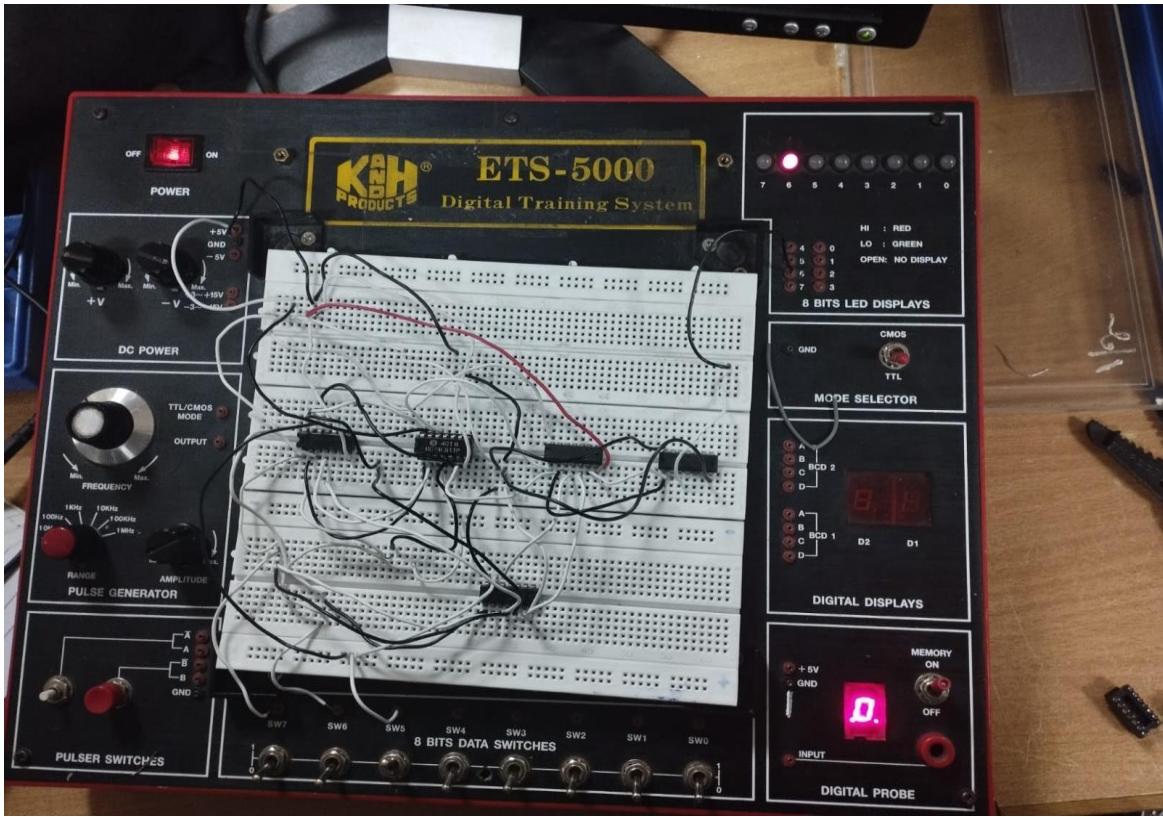


Hardware outputs









Task #3

inputs :a,b,c,d

set 00 :45

01 :55

10 :65

11: 65+

a,b:speed limit

c,d:speed of vehicle

00 :45

01 :55

10 :65

11: 65+

f=0 speed of vehicle <speed limit

f=1 speed of vehicle>speed limit

g=1 speed of vehicle > 65 or 10 more than speed limit

g=1 else case

a	b	c	d	f	g
0	0	0	0	0	0
0	0	0	1	1	0
0	0	1	0	1	1
0	0	1	1	1	1
0	1	0	0	0	0
0	1	0	1	0	0
0	1	1	0	1	0
0	1	1	1	1	1
1	0	0	0	0	0
1	0	0	1	0	0
1	0	1	0	0	0

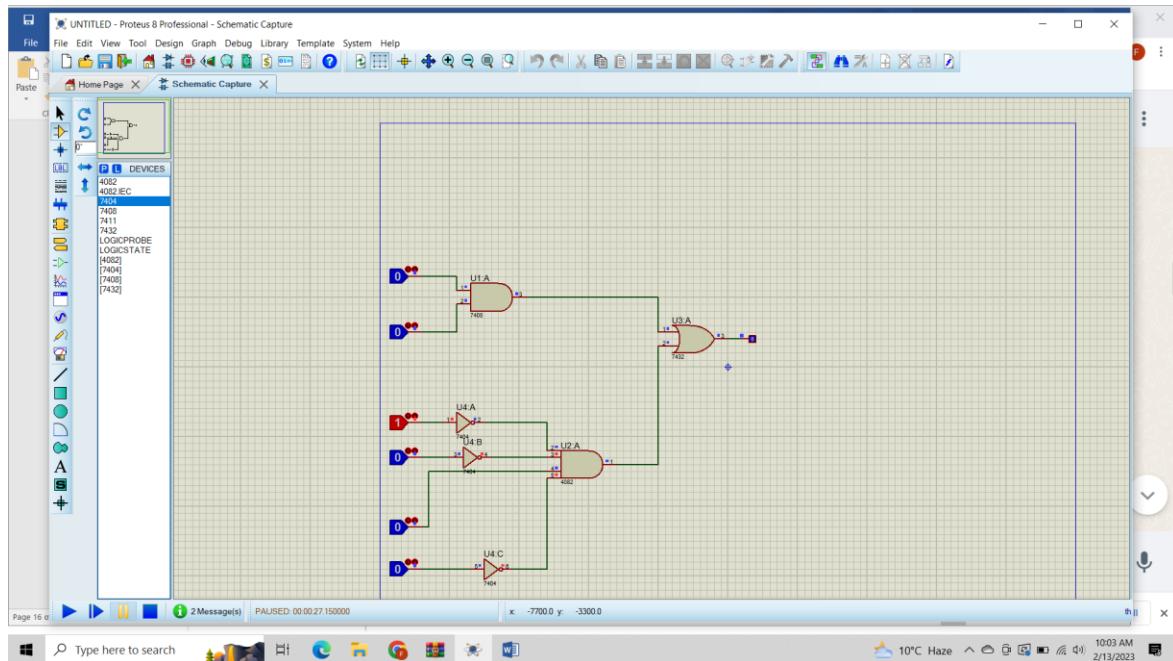
1	0	1	1	1	1
1	1	0	0	X	X
1	1	0	1	X	X
1	1	1	0	X	X
1	1	1	1	x	x

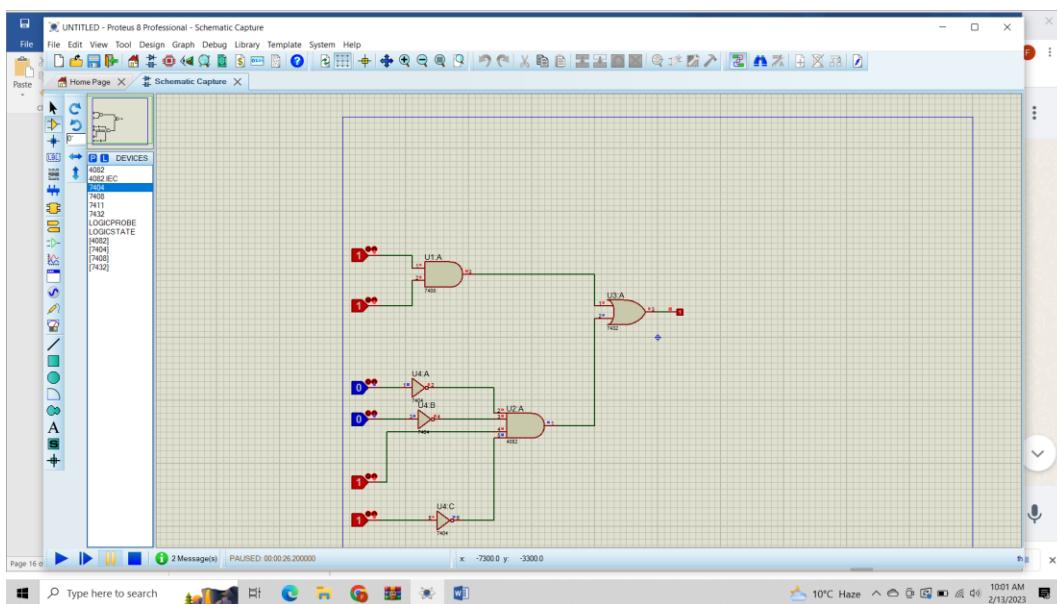
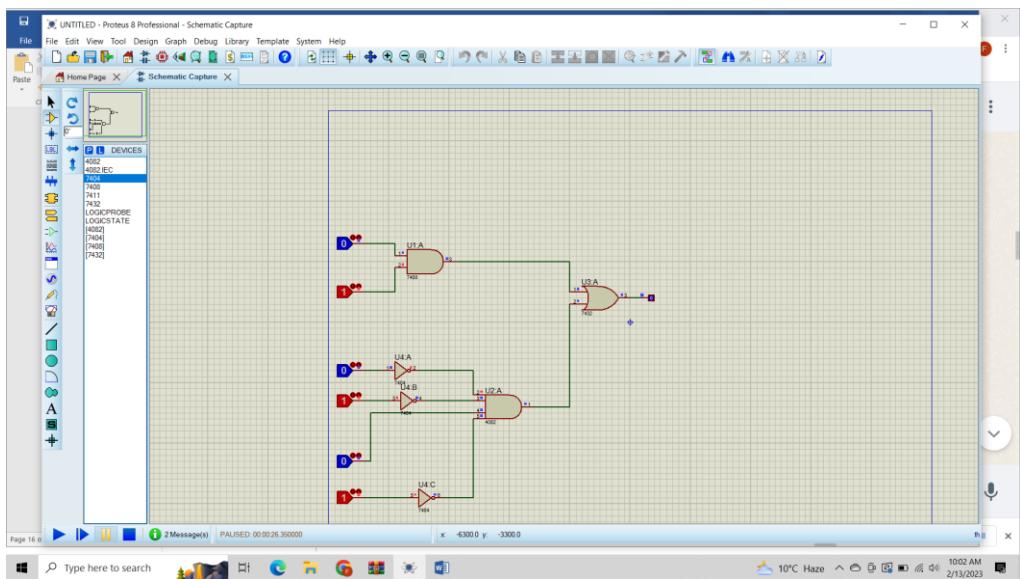
Using the k map we can simplify the relation .after the working the expression becomes:
 $g=cd + 'a'bc'd$

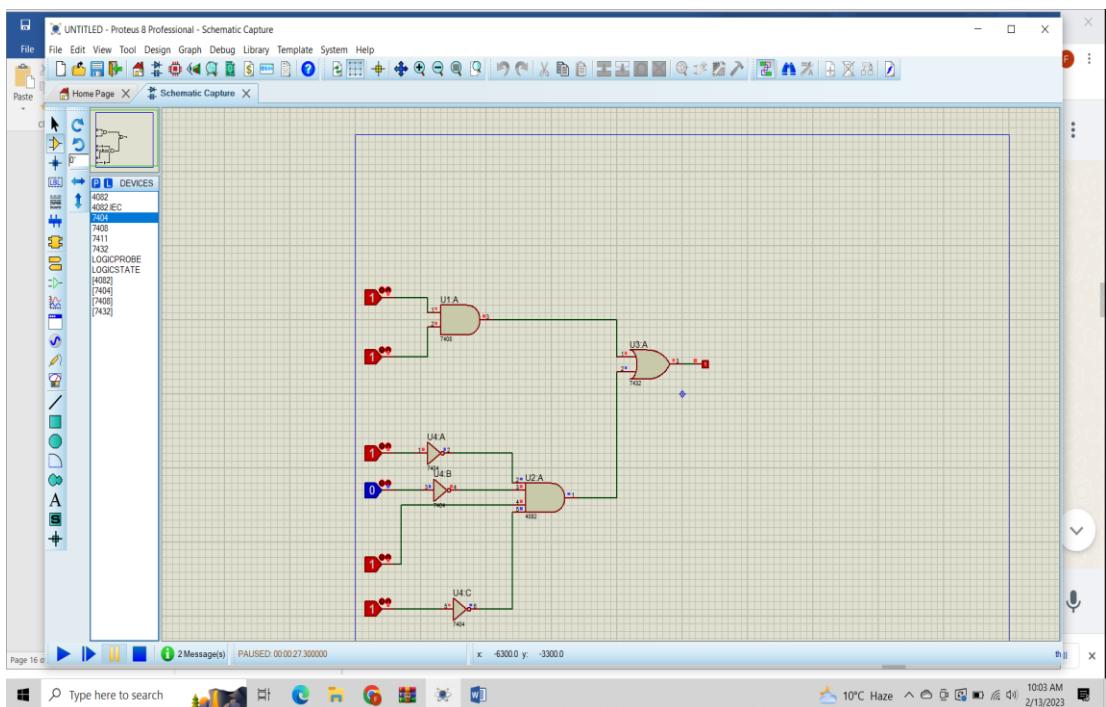
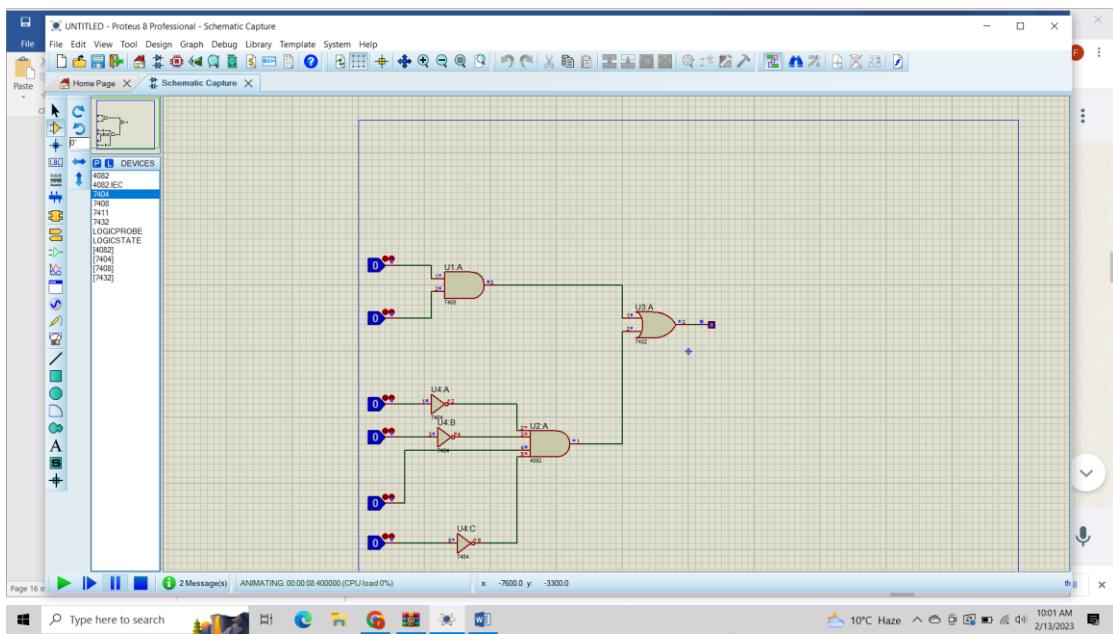
Similarly

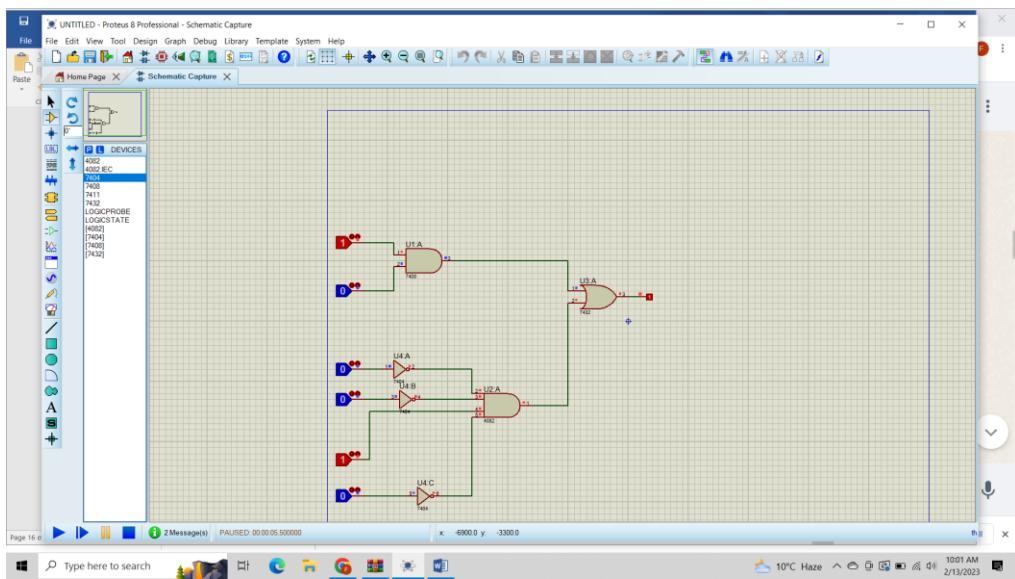
$$F=cd + 'ac + 'a'bd$$

G proteus implementation:









F implementation proteus

