

Assignment No. 1

- Assignment No. 1: Design and implement Half adder and full adder
a] Using Basic Gates b] Using universal gate.
- Assignment No. 2: Design and implement half adder subtractor and full subtractor.
a] Using Basic Gates b] Using Universal gate

Objective:

- To understand concept of Half adder, Full adder
- To understand the concept of Half subtractor, Full subtractor.
- To implement the Half adder, full adder, Half subtractor & full subtractor using logic gates

Hardware required:-

IC 7486, IC 7432, IC 7408, IC 7400, General purpose board, DC power supply etc.

Outcomes:-

To design combinational circuits using K-map & Boolean algebra.

Theory:-

The simplest binary adder is called half adder. Half adder has two input bits & two outputs. One output bit is the sum and other is the carry. They are represented by 'S' and 'C' respectively in logic symbol.

A half adder has no provision add to carry from the lower bits when binary numbers are added. When the two inputs and carry are able to be added the number of input bits becomes three and the input combination increase to eight. For this full adder is used

Procedure:-

- 1] verify the gates.
- 2] Make the connections as per the circuit diagram.
- 3] Switch Vcc and apply connections of input according to truth table.
- 4] Note down the output reading for half / full adder and the sum & carry bit.

Circuit Diagram

Half adder:-

Truth table

Input		Output	
A	B	Sum	Carry
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

Circuit Diagram:-

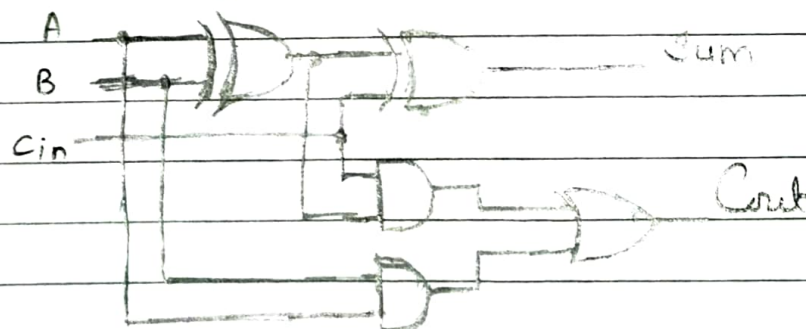


Full adder:

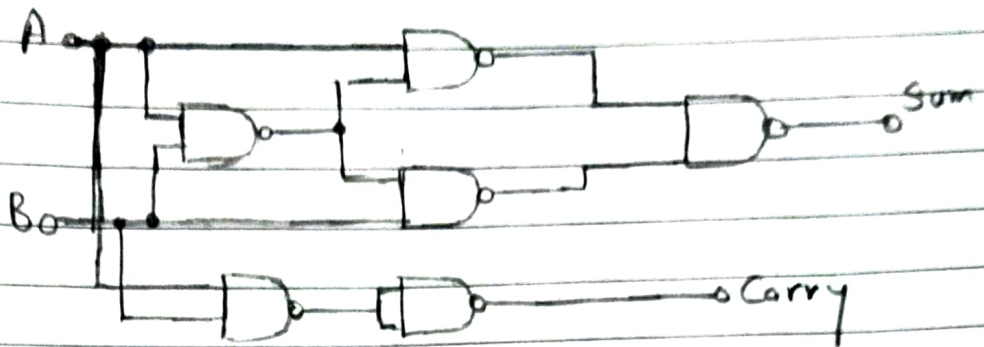
Truth Table

Input			Output	
A	B	C _{in}	Sum	Carry
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

Using Basic gate.



Using NAND Gate



Conclusion :-

Thus realization of Half adder & full adder using basic gates & universal gates.

