EXPT NO. : 2

AIM:

To design and construct half adder, full adder circuits and verify the truth table using logic gates.

APPARATUS REQUIRED:

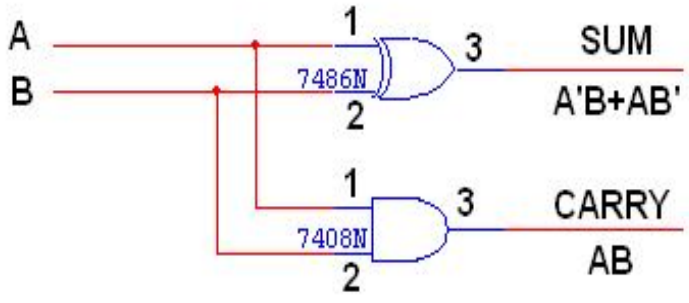
Sl. No.	COMPONENT	SPECIFICATION	QTY.
1.	AND GATE	IC 7408	1
2.	X-OR GATE	IC 7486	1
3.	OR GATE	IC 7432	1
4.	BREAD BOARD	-	1
5.	PATCH CORDS	-	-
6.	POWER SUPPLY WITH LOGIC PROBE	-	1

HALF ADDER:

A half adder has two inputs for the two bits to be added and two outputs one from the sum ' S' and other from the carry 'C' into the higher adder position. Above circuit is called as a carry signal from the addition of the less significant bits sum from the X-OR Gate the carry out from the AND gate.

LOGIC DIAGRAM:

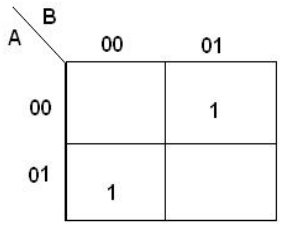
HALF ADDER



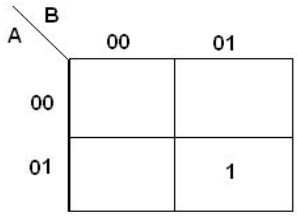
TRUTH TABLE:

A	B	CARRY	SUM
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

K-Map for SUM:



K-Map for CARRY:



SUM = A'B + AB'

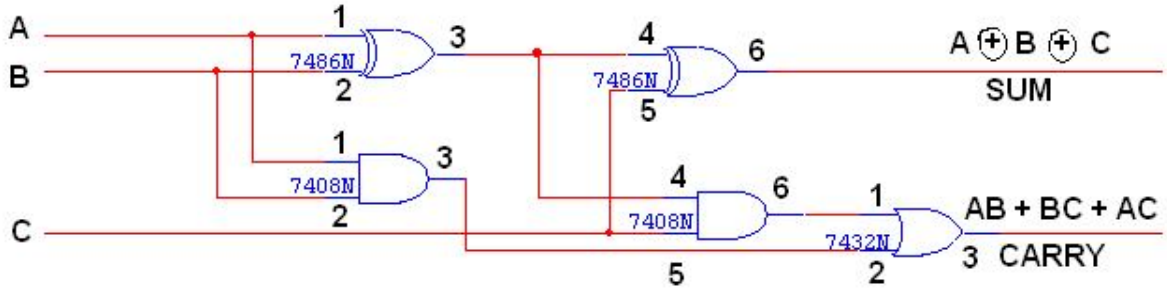
CARRY = AB

FULL ADDER:

A full adder is a combinational circuit that forms the arithmetic sum of input; it consists of three inputs and two outputs. A full adder is useful to add three bits at a time but a half adder cannot do so. In full adder sum output will be taken from X-OR Gate, carry output will be taken from OR Gate.

LOGIC DIAGRAM:

FULL ADDER USING TWO HALF ADDERS:



TRUTH TABLE:

A	B	C	CARRY	SUM
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

PROCEDURE:

(i) Connections are given as per circuit diagram.

(ii) Logical inputs are given as per circuit diagram.

(iii) Observe the output and verify the truth table.

OBSERVATION TABLE:

Sl. No.	CIRCUIT	INPUT			OUTPUT	
		A	B	C	SUM	CARRY
1.	HALF ADDER					
2.	FULL ADDER					