EXP.NO: 11

AIM:

To design and implement the logic gates using Logisim simulator.

PROCEDURE:

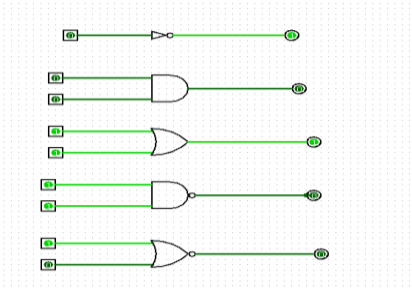
1) Pick and place the necessary gates.
2) Insert 1 or 2 inputs into the canvas.
3) Connect the inputs to the following gates:
    a. XOR gate
    b. AND gate
    c. OR gate
    d. NOR gate
    e. NOT gate
    f. NAND gate
4) Insert 1 output into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

TRUTH TABLE:

AND

A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

OUTPUT



Result:

Thus the verification of logic gates completed successfully

EXP:12

HALF ADDER

AIM:

To design and implement the two bit half adder using Logisim simulator.

PROCEDURE:

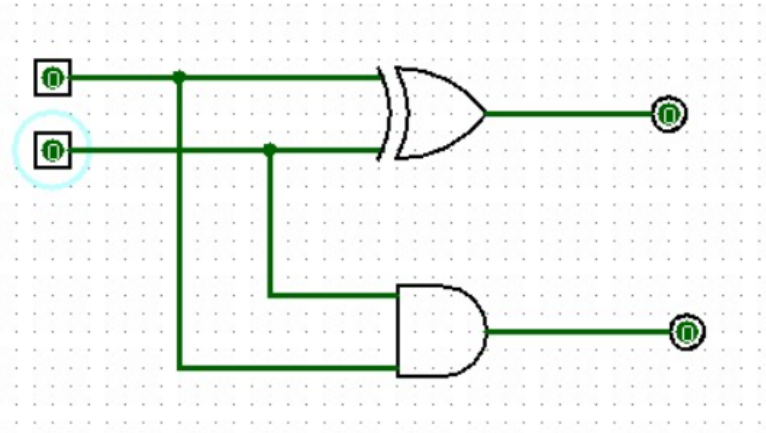
7) Pick and place the necessary gates.
8) Insert 2 inputs into the canvas.
9) Connect the inputs to the XOR gate and AND gate.
10) Insert 2 outputs into the canvas.
11) Make the connections using the connecting wires.
12) Verify the truth table.

TRUTH TABLE:

A	B	S	C
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

S = A XOR B C = A AND B

OUTPUT



RESULT: Thus 2-bit half adder has been designed and implemented successfully using logisim simulator.

EXP:13

TWO BIT HALF SUBTRACTOR

AIM:

To design and implement the two bit half subtractor using Logisim simulator.

PROCEDURE:

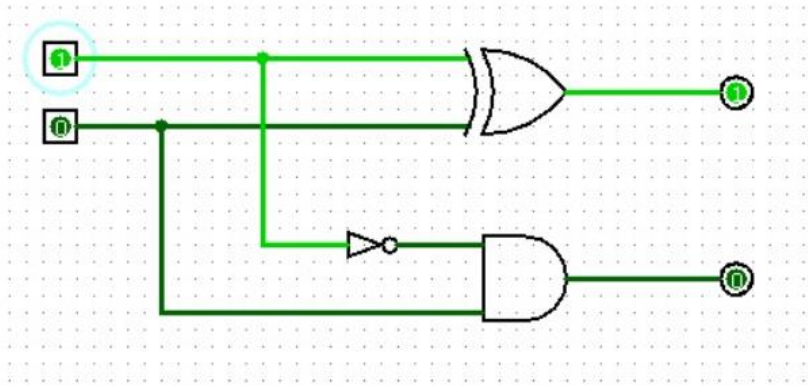
1) Pick and place the necessary gates.
2) Insert 2 inputs into the canvas.
3) Connect the inputs to the OR gate, AND gate and NOT gate.
4) Insert 2 outputs into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

TRUTH TABLE:

Inputs		Outputs	
A	B	Diff	Borrow
0	0	0	0
0	1	1	1
1	0	1	0
1	1	0	0

Diff=A'B+AB'
Borrow = A'B

OUTPUT



RESULT: Thus 2-bit half subtractor has been designed and implemented successfully using logisim simulator.

EXP:14

FULL ADDER

AIM:

To design and implement the full adder using Logisim simulator.

PROCEDURE:

1) Pick and place the necessary gates.
2) Insert 3 inputs into the canvas.
3) Connect the inputs to the XOR gate, AND gate and OR gate.
4) Insert 2 outputs into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

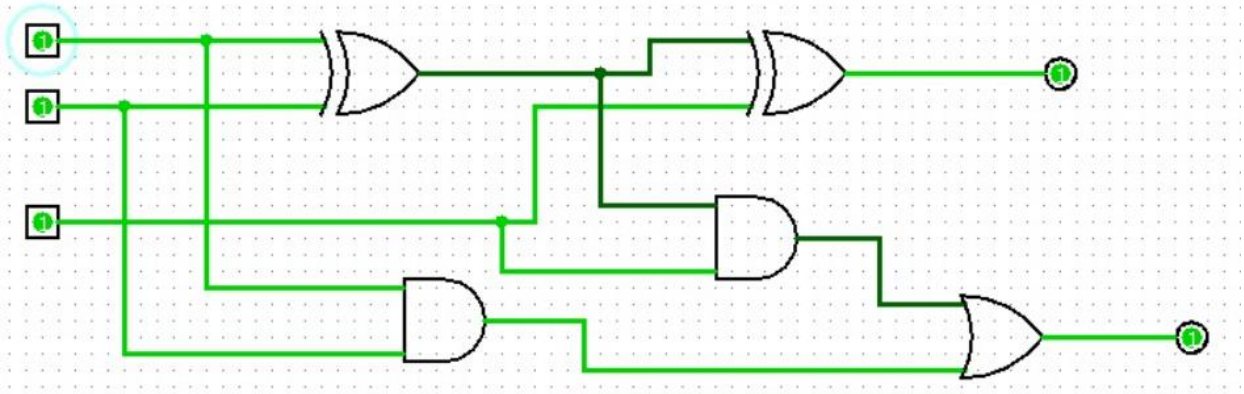
TRUTH TABLE:

Inputs			Outputs	
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

$Sum=(A \oplus B) \oplus C_{in}$

$Carry=A.B + (A \oplus B)$

OUTPUT



RESULT: Thus full adder has been designed and implemented successfully using logisim simulator.

EXP:15

FULL SUBTRACTOR

AIM:

To design and implement the full subtractor using Logisim simulator.

PROCEDURE:

1) Pick and place the necessary gates.
2) Insert 3 inputs into the canvas.
3) Connect the inputs to the XOR gate, AND gate and OR gate.
4) Insert 2 outputs into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

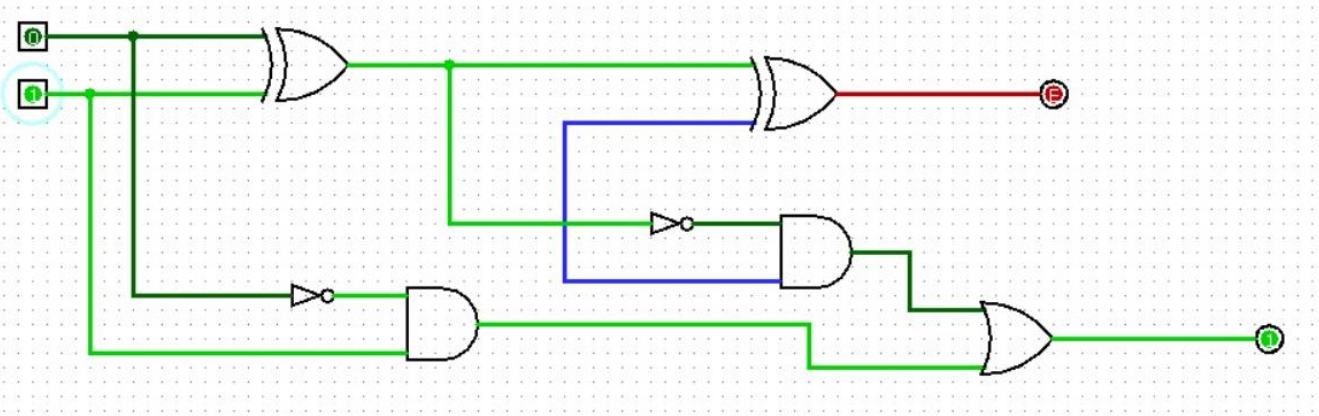
TRUTH TABLE:

Inputs			Outputs	
A	B	$Borrow_{in}$	Diff	Borrow
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	0	1
1	0	0	1	0
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

Diff=(A ⊕ B) ⊕ '$Borrow_{in}$'

Borrow=A'.B + (A ⊕ B)'

OUTPUT



RESULT: Thus full subtractor has been designed and implemented successfully using logisim simulator.