HALF ADDER

EXP.NO: 27

AIM:

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

PROCEDURE:

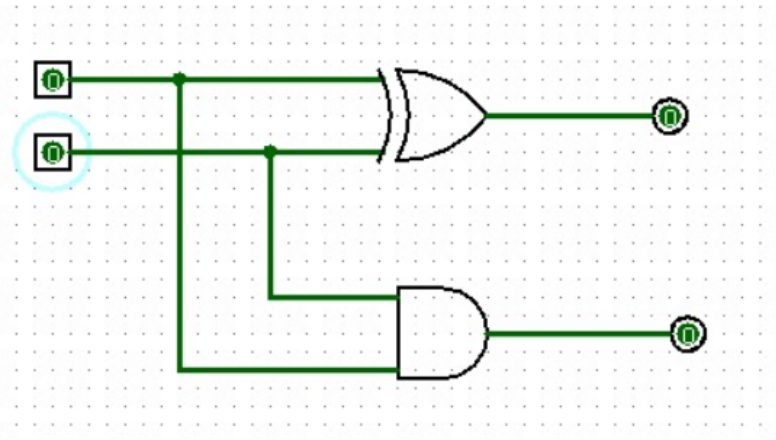
1) Pick and place the necessary gates.
2) Insert 2 inputs into the canvas.
3) Connect the inputs to the XOR gate and AND gate.
4) Insert 2 outputs into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

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.

TWO BIT HALF SUBTRACTOR

EXP.NO: 28

AIM:

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

PROCEDURE:

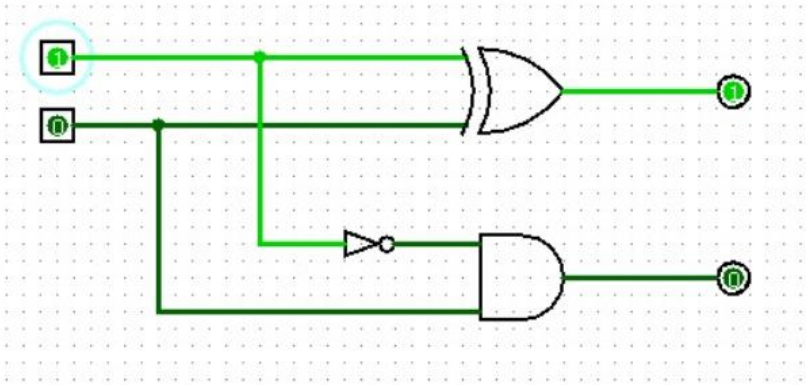
1) Pick and place the necessary gates.
2) Insert 2 inputs into the canvas.
3) Connect the inputs to the OR gate, AND gate and NOT gate.
4) Insert 2 outputs into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

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.

FULL ADDER

EXP.NO: 29

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.

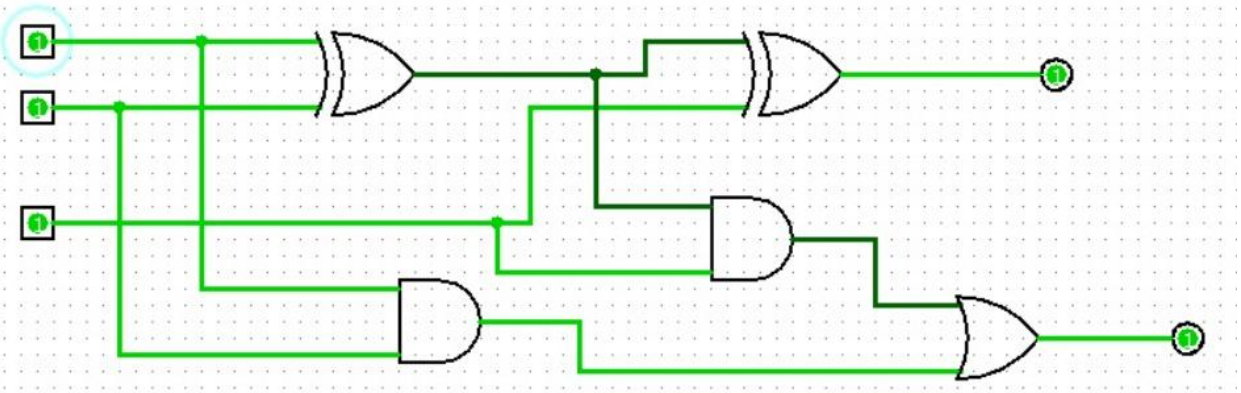
TRUTH TABLE:

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.

FULL SUBTRACTOR

EXP.NO: 30

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.

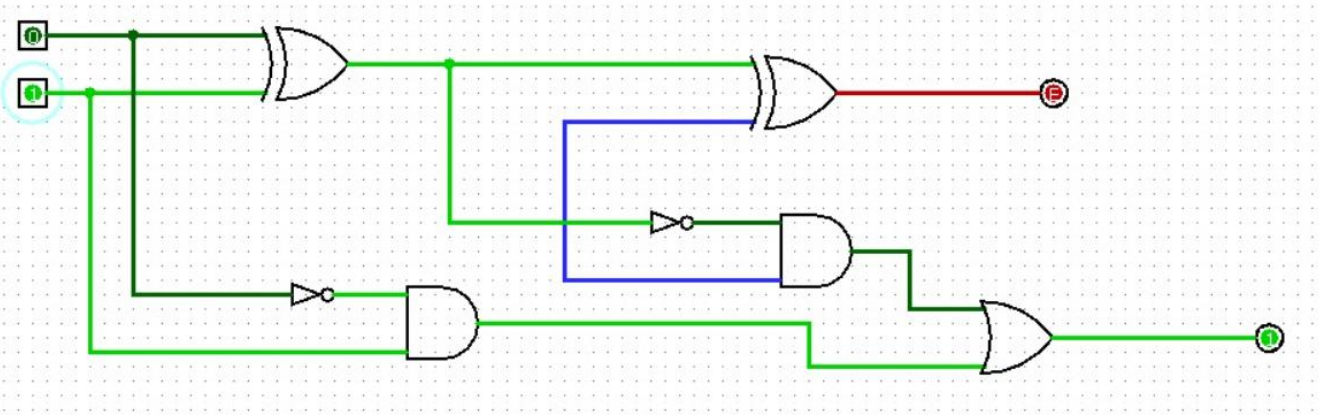
TRUTH TABLE:

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=$(A \oplus B) \oplus 'Borrow_{in}'$

Borrow=A'.B + $(A \oplus B)'$

OUTPUT



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