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B. Tech Computer Science and Engineering

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Sem: 2

PRACTICAL-EXAM

AIM: - To design and perform ALU circuit
(i) Arithmetic operation of 2 number having 4 bits
(ii) Logical operation of 2 number having 4 bits

- Components: -
- Full Adder
 - AND, OR, XOR, NOT Gates
 - Multiplexers

Reference Table: -

D	P	R	CIN	OPERATION
0	1	0	0	F=A
0	1	0	1	F=A+1
0	0	0	0	F=A+B
0	0	0	1	F=A+B+1
0	0	1	0	A+B'
0	0	1	1	A+B'+1
1	0	0	0	AND
1	0	1	1	OR
1	1	1	0	COMPLEMENT-A
1	1	0	0	XOR

Labwork: -
(i) Arithmetic operation of 2 number having 4 bits

Answer:

In given below circuit, if we keep **0 input at zero (0)**, then it will do Arithmetic operations between two numbers.
If we keep value as follows: -
Data (assume): -

A – 1010

B – 1110

And if we want to perform **subtraction**, i.e. **$A+B'+1$**

Therefore, according to table, we will have to keep values as follows: -

O = 0

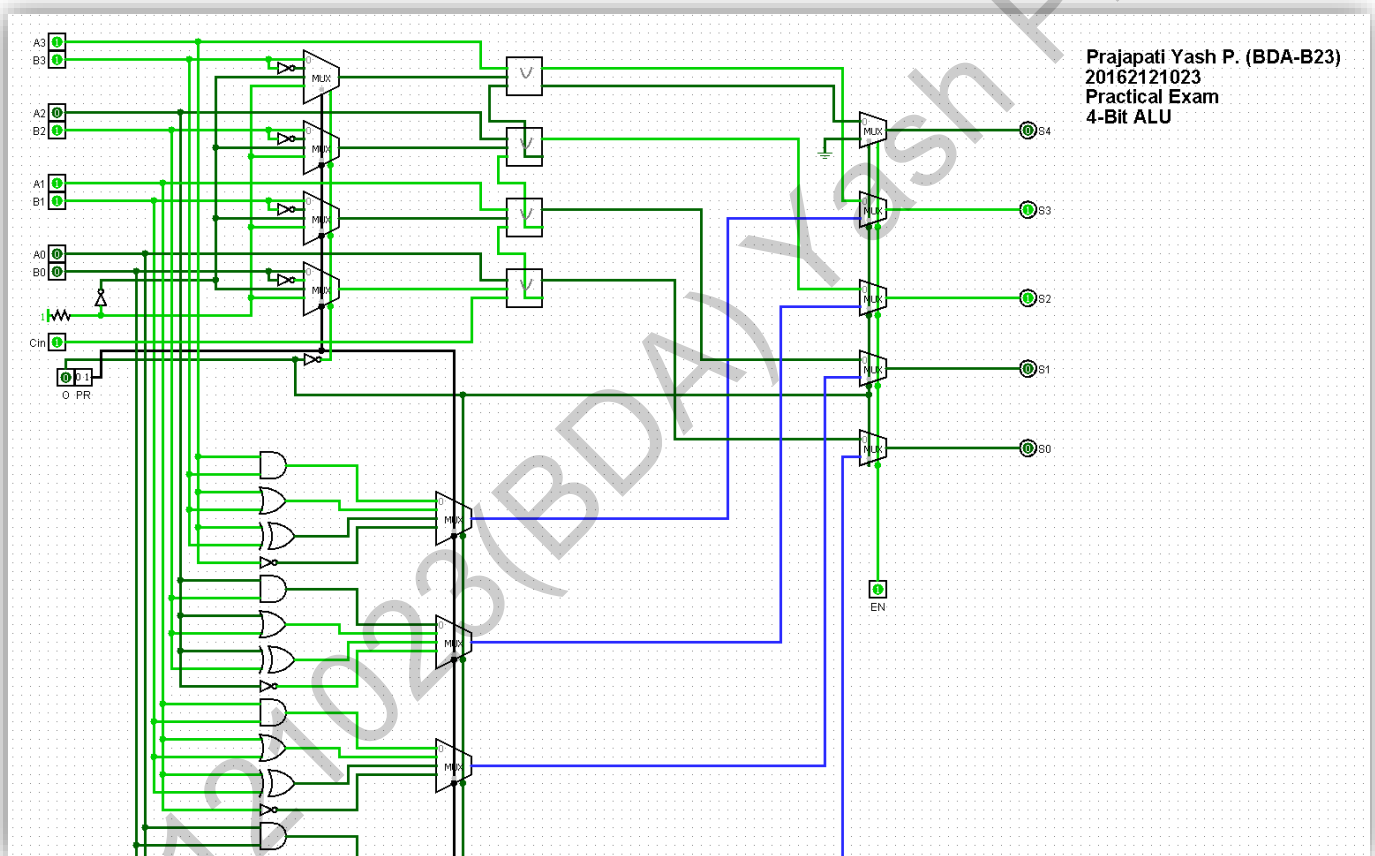
P = 0

R = 1

Cin = 1

Expected Output: - 1100

OUTPUT



(ii) Logical operation of 2 number having 4 bits

Answer:

In given circuit, if we keep **O input at one (1)**, then it will do Logical operations between two numbers.

If we keep value as follows: -

Data (assume): -

A – 1010

B – 1110

And if we want to perform **AND operation**.

Therefore, according to table, we will have to keep values as follows: -

O = 1

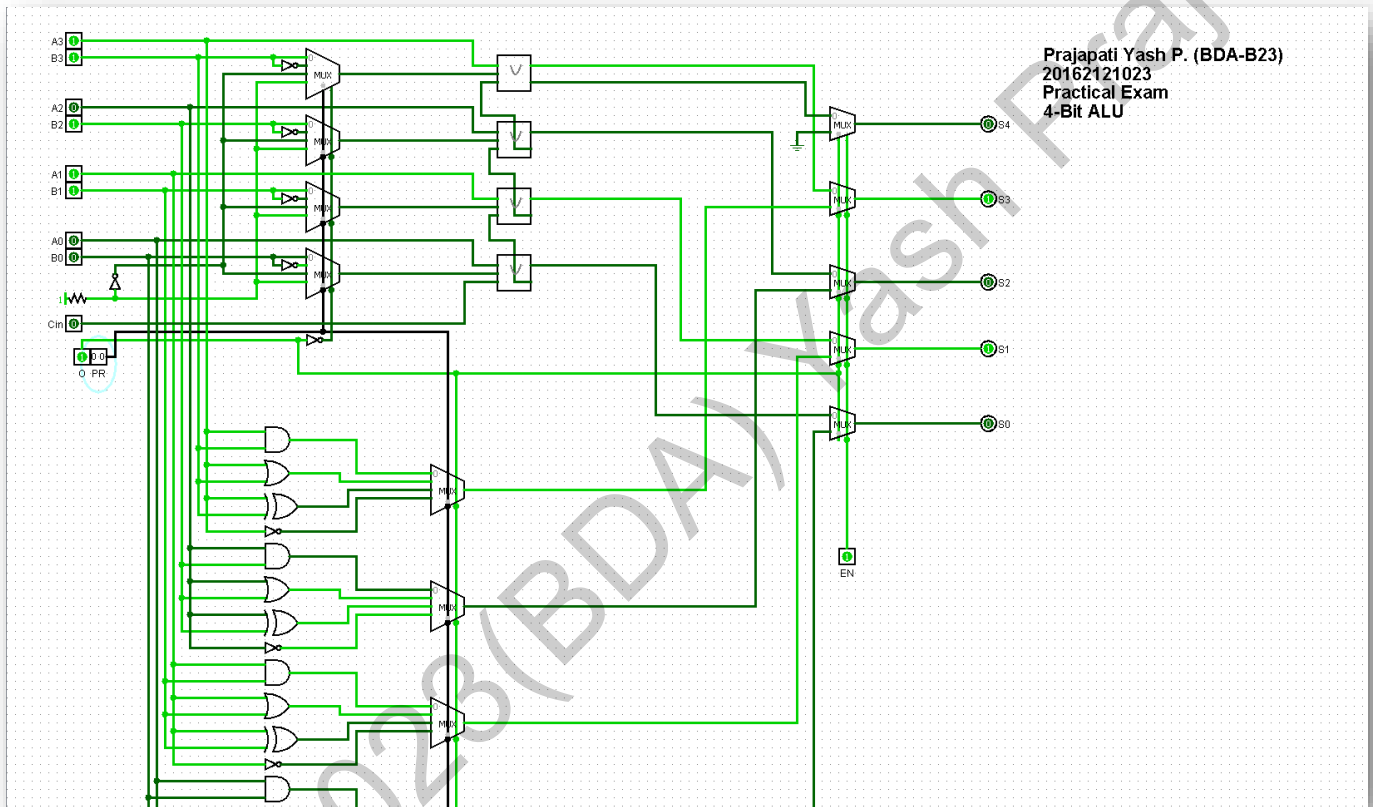
P = 0

R = 0

Cin = 0

Expected Output: - 1010

OUTPUT



Conclusion: -

Hence, by studying and analysing the results of the following circuit, we conclude the design and working of the ALU circuit.