$B_{out} = \bar{A} \cdot B_{in} + \bar{A} \cdot B + B \cdot B_{in}$

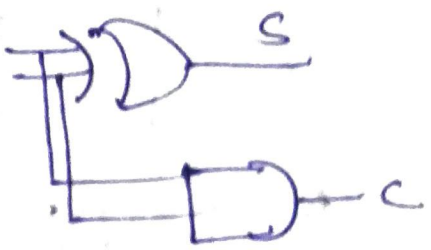
HALF ADDER :-

Half Adder is a combinational circuit used for addition operation. It consists of two i/ps & two o/ps. The two o/ps are sum & carry.

Half adder is the building block for more complex adder circuits such as full adders & multiple-bit adders.

The sum output is the least significant bit [LSB] of result, while the carry output is the Most significant bit [MSB] of the result, indicating whether there was a carry-over from the addition of two inputs. The half adder can be implemented using XOR gate & AND gate.

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



$S = A \wedge B$

$C = A \cdot B$