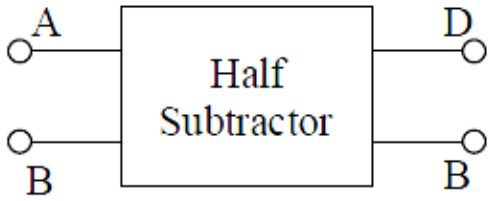
SUBTRACTORS

1. HALF – SUBTRACTOR

A half subtractor is an arithmetic circuit that subtracts one bit from the other. It has two inputs (A, B) and two outputs namely Difference (D) and Borrow (B) as shown in the block diagram below. Assume B, bit is subtracted from A bit. According to the rules of binary subtraction the difference and Borrow for the different input is shown in truth table below.



Block diagram of
Half Subtractor

Inputs		Outputs	
A	B	D	B
0	0	0	0
0	1	1	1
1	0	1	0
1	1	0	0

Truth table of
Half Subtractor

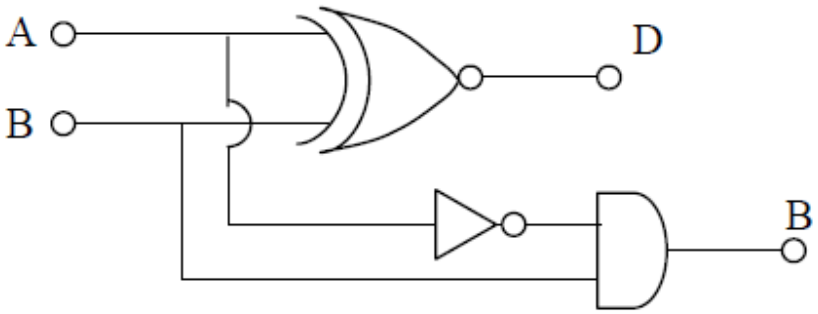


Fig: Logic diagram of half subtractor

2. FULL SUBTRACTOR

When the difference of two binary numbers have to be found about, it is not sufficient to subtract one bit from another. One should consider the borrow to the previous position as well. Such a circuit is knows as full subtractor.

Inputs			Outputs	
A	B	b_i	D	B
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

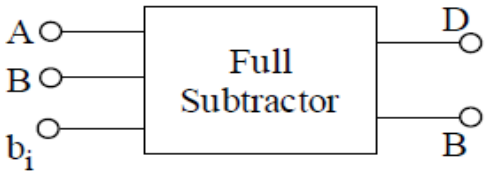


Fig: Truth Table and Logic Symbol

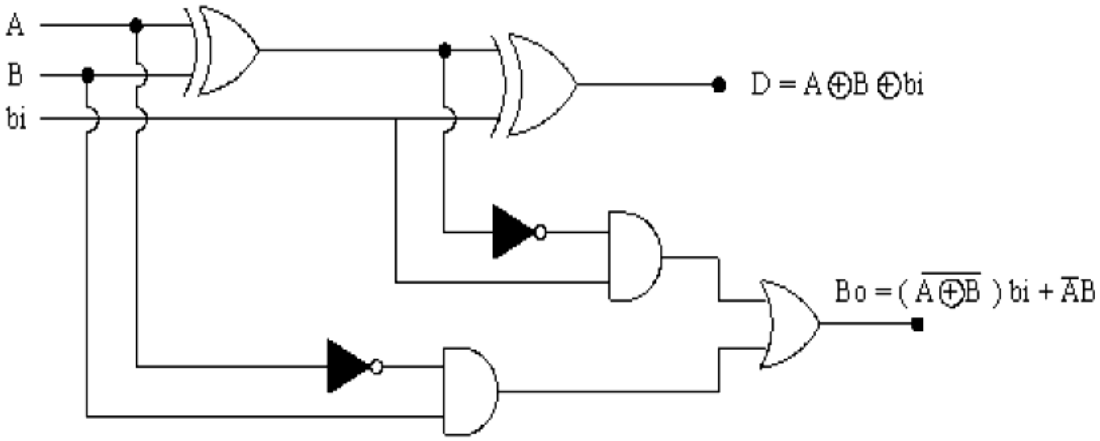


Fig: Logic diagram of full subtractor