

On input side, B is subtracted from A to give output  $D_i$  (Difference) if B is larger than A, we need a borrow ( $B_o$ ).

A block diagram of half subtractor is shown in fig (2).

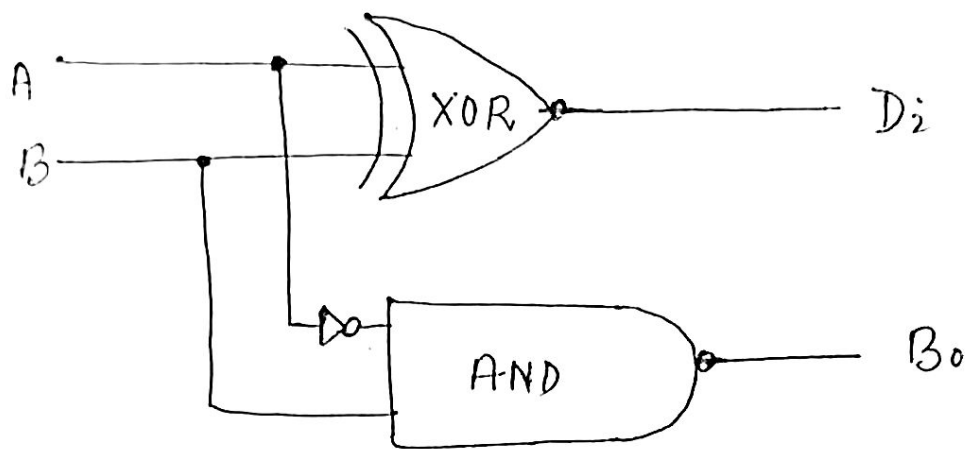


Fig - 2. Half Subtractor.

The Boolean expression for  $D_i$  column is;

$$A \oplus B = D_i$$

The Boolean expression for  $B_o$  column is;

$$\bar{A} \cdot B = B_o$$

Combining these two expressions in a logic diagram gives the logic circuit (fig-2); for a half subtractor.

# HALF SUBTRACTOR

The binary subtractors are just like adders.

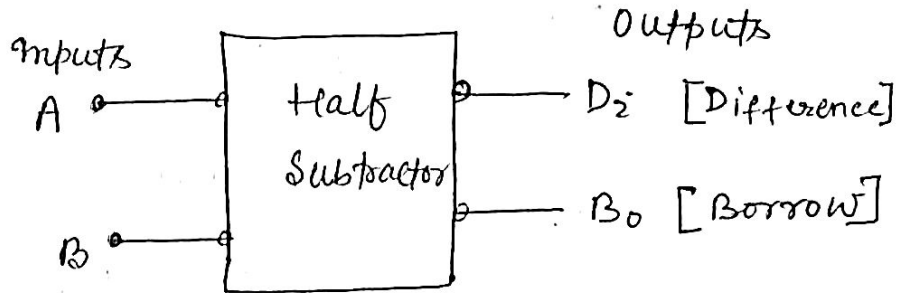


Fig-1

The binary subtractor table for half subtractor is given in table I.

Inputs		Outputs	
A	B	Diff.	B <sub>0</sub>
0	0	0	0
0	1	1	1
1	0	1	0
1	1	0	0
A·B		Difference	Borrow

Fig. Table I.

✓ Binary D.  
 1 1 (3)  
 - 0 1 (-1)  
 -----  
 1 0 (2)

✓  
 0 0'  
 - 0 -1  
 -----  
 0 1 borrow 1