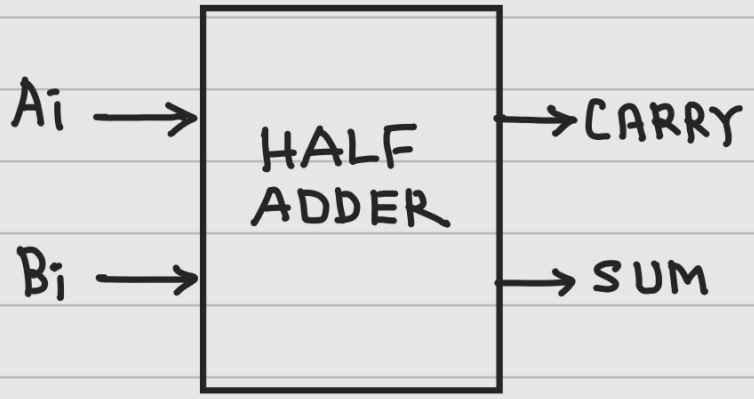
BLOCK DIAGRAM, Truth-Table OF HALF-ADDER

Block Diagram

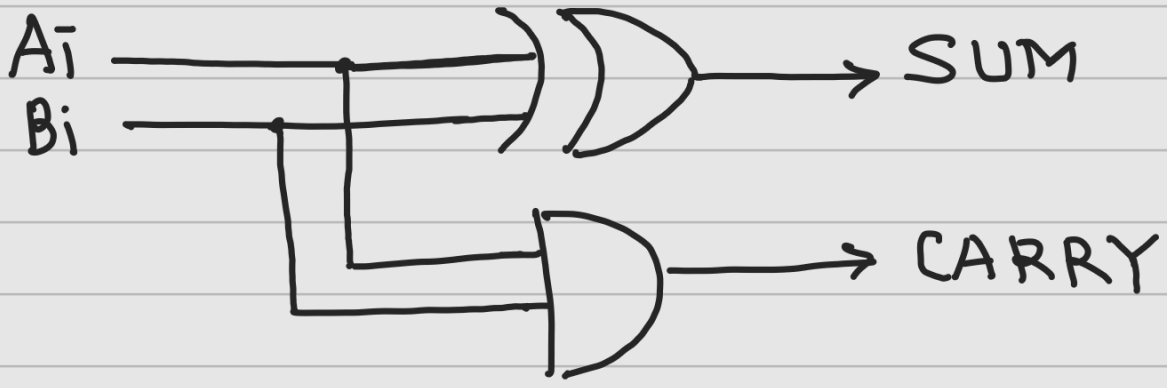


Truth-Table

Ai	Bi	SUM	CARRY
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

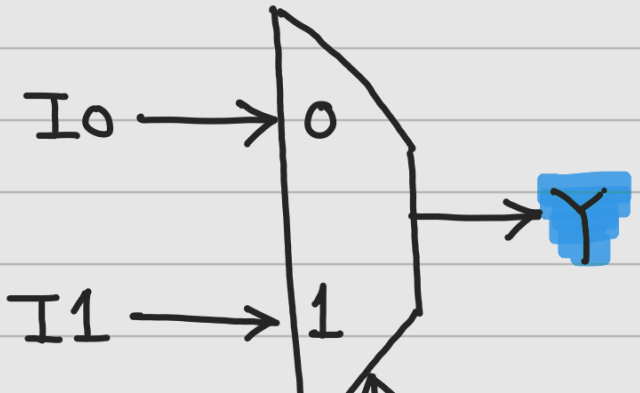
$$SUM = A_i \oplus B_i \;,\; CARRY = A_i . B_i$$

GATE-LEVEL SCHEMATIC OF HALF-ADDER



2:1 MULTIPLEXER SYMBOL & TRUTH-TABLE

SYMBOL



TRUTH-TABLE

S	Y
0	Io
1	I1

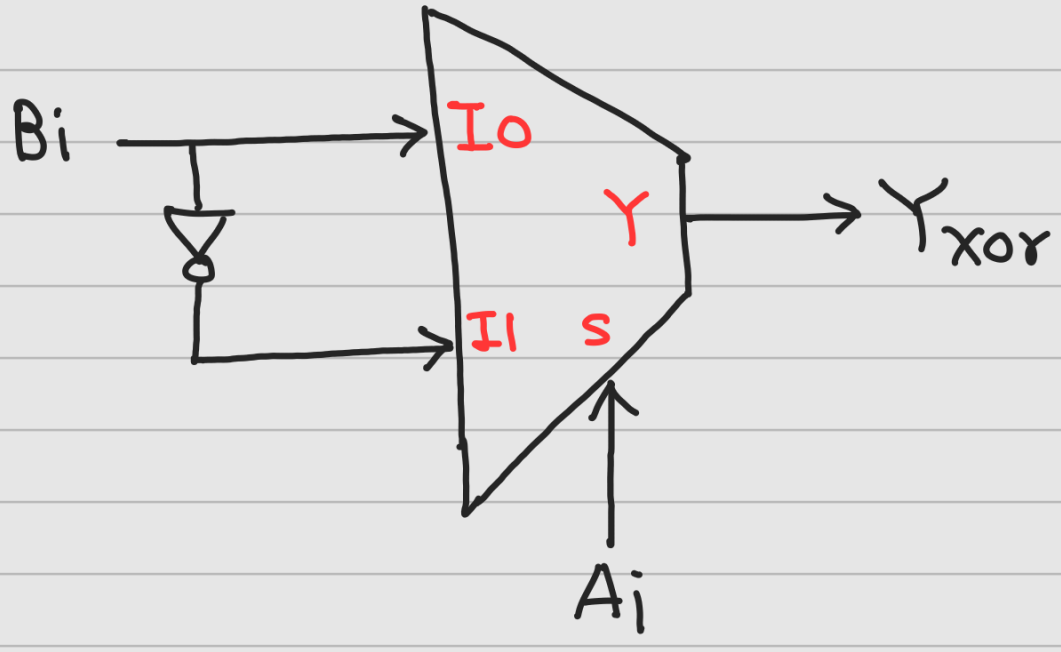
S

CONVERTING 2:1 Multiplexer into Ex-OR Gate

TRUTH-TABLE OF EX-OR Gate

	A_i	B_i	Y_{xor}	
$A_i = 0$	0	0	0	$Y_{xor} = B_i$
	0	1	1	
$A_i = 1$	1	0	1	$Y_{xor} = \overline{B_i}$
	1	1	0	

$\therefore$ Give A_i as Select line of MUX
B_i as I_0 i/p of MUX
$\overline{B_i}$ as I_1 i/p of MUX

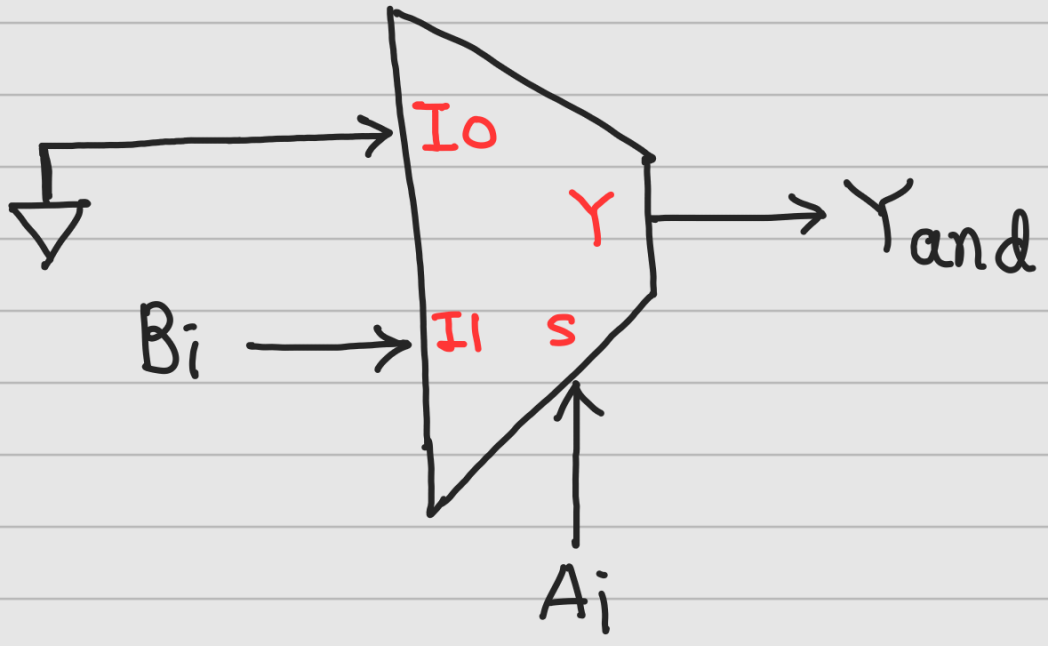


CONVERTING 2:1 Multiplexer into AND Gate

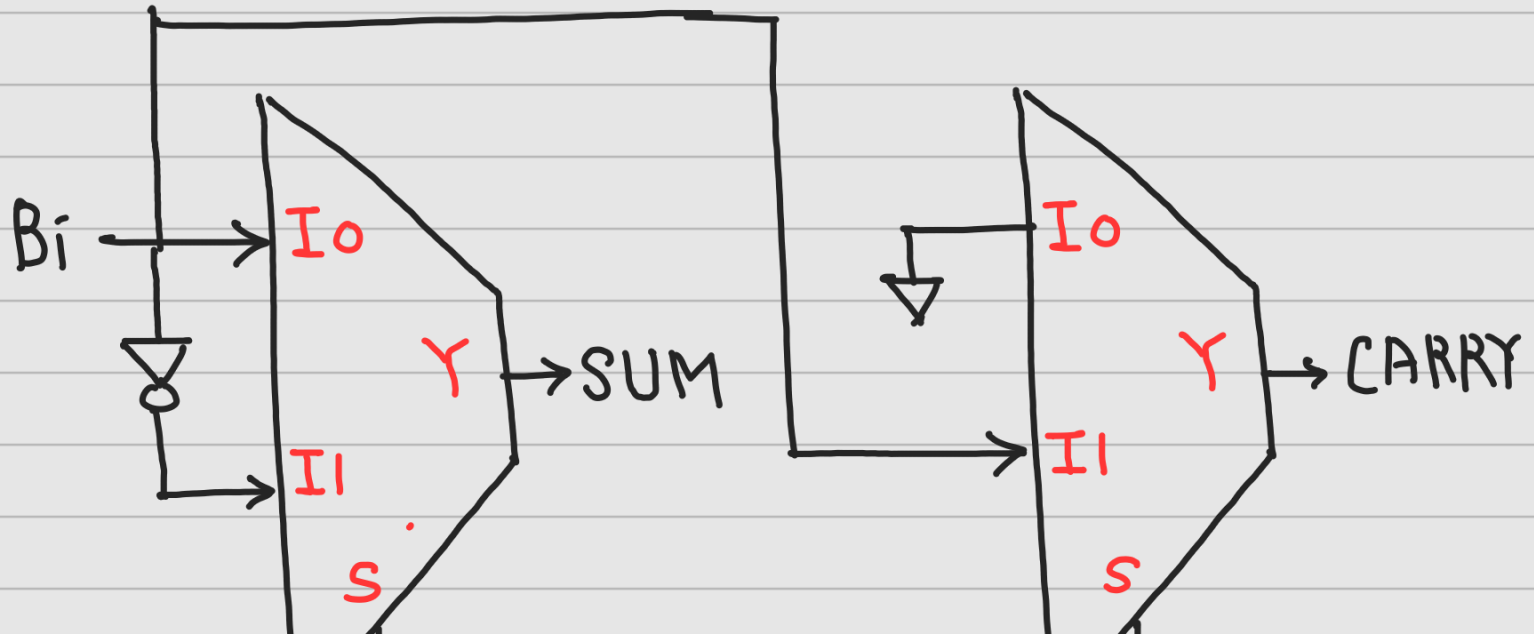
TRUTH-TABLE OF AND Gate

	A_i	B_i	Y_{xor}	
$A_i = 0$	0	0	0	$Y_{xor} = 0$
	0	1	0	
$A_i = 1$	1	0	0	$Y_{xor} = B_i$
	1	1	1	

$\therefore$ Give A_i as Select line of MUX
0 as I_0 i/p of MUX
B_i as I_1 i/p of MUX

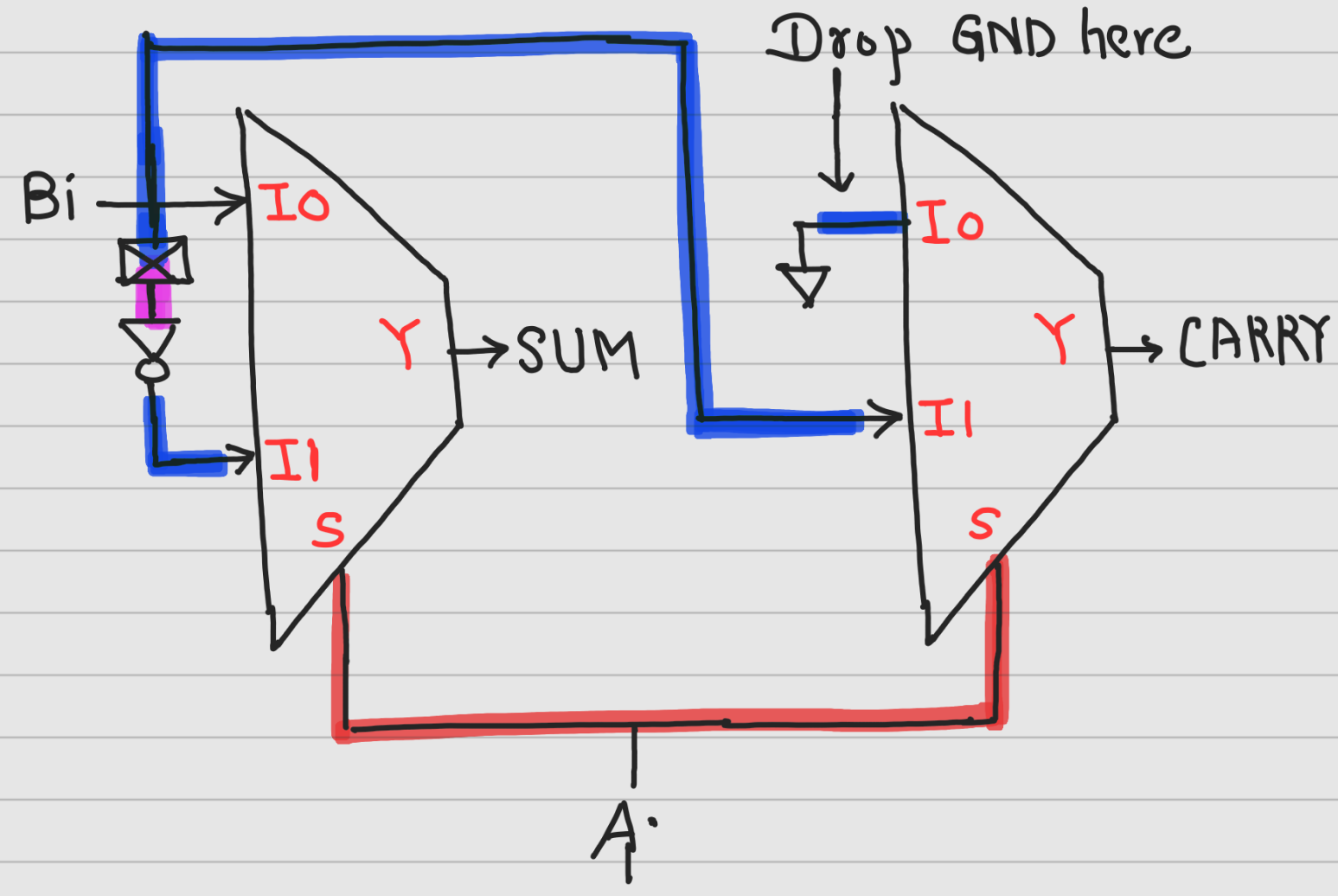


MULTIPLEXER Level Schematic of Half-Adder



Ai

LAYER CONNECTIONS



Metal-1 Layer

Polysilicon Layer

Metal-1 To Polysilicon Contact