Implementing 8X1 MUX using 4X1 MUX

(Special Case)

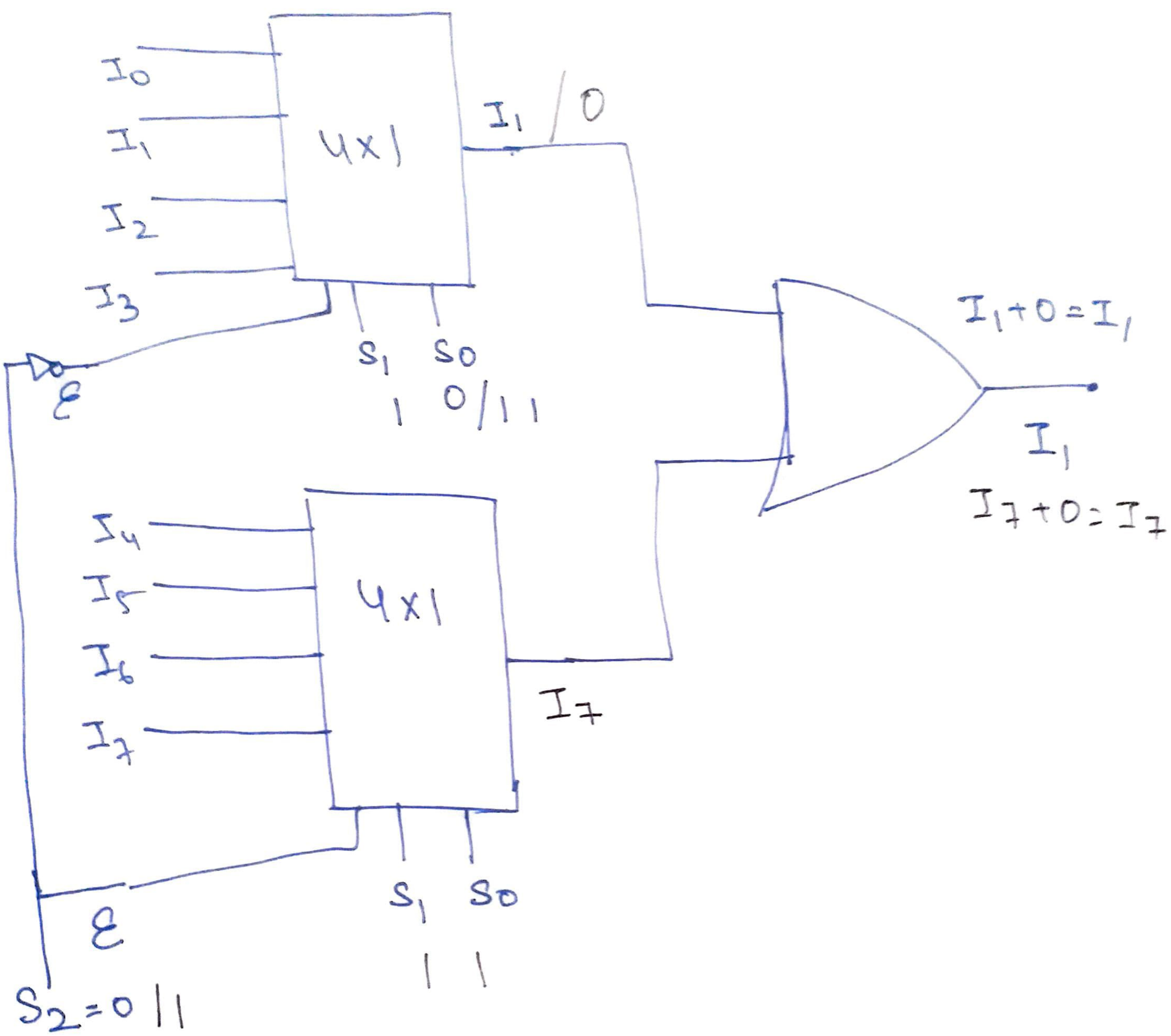
↳ No. of I/P data lines.

* $\frac{n_1}{n_2} \; \frac{8}{4} = 2$

* $\frac{2}{4} = 0.5 \;\times$

↳ This helped by enable (Rest case Enable is high and working ON)

S_2	S_1	S_0	Y
0	0	0	I_0
0	0	1	I_1
0	1	0	I_2
0	1	1	I_3
1	0	0	I_4
1	0	1	I_5
1	1	0	I_6
1	1	1	I_7



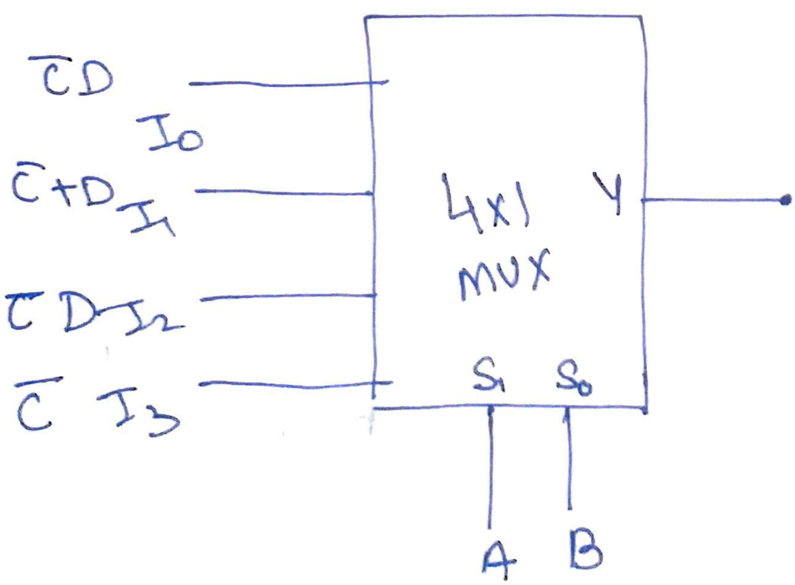
I_0
I_1
I_2
I_3
4x1
I_1 / 0
S_1 S_0
1 0/1 1
E
$I_1 + 0 = I_1$
I_1
$I_7 + 0 = I_7$
I_4
I_5
I_6
I_7
4x1
I_7
S_1 S_0
1 1
E
$S_2 = 0 / 1$

Implementating of Boolean function using MUX

Q $F(A,B,C,D) = \Sigma m(1,4,5,7,9,12,13)$ using 4×1 MUX.

AB \ CD	$\bar{C}\bar{D}$ 00	$\boxed{\bar{C}D}$ 01	CD 11	$C\bar{D}$ 10	
$\bar{A}\bar{B}$ 00	[0] 0	[1] 1	[3] 0	[2] 0	$\bar{C}D = I_0$
$\bar{A}B$ 01	[4] 1	[5] 1	[7] 1	[6]	$\bar{C}+D = I_1$
AB 11	[12] 1	[13] 1	[15]	[14]	$\bar{C}$
$A\bar{B}$ 10	[8]	[9] 1	[11]	[10]	$\bar{C}D$

A S_1	B S_0	Y	question O/P
$\boxed{0}$	$\boxed{0}$	I_0	$\bar{C}D$
0	1	I_1	$\bar{C}+D$
1	0	I_2	$\bar{C}D$
1	1	I_3	$\bar{C}$

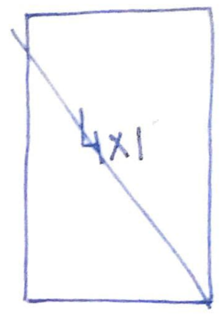


$S_0 = B$, $S_1 = A$

1- Bit Full Adder using MUX

(4:1 MUX)

A	B	Cin	S	Co
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1



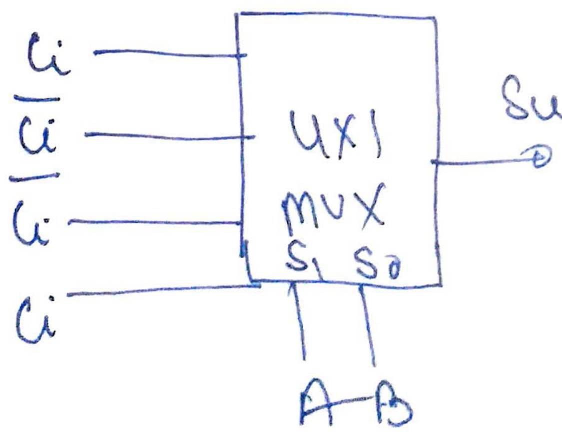
A=0, B=0

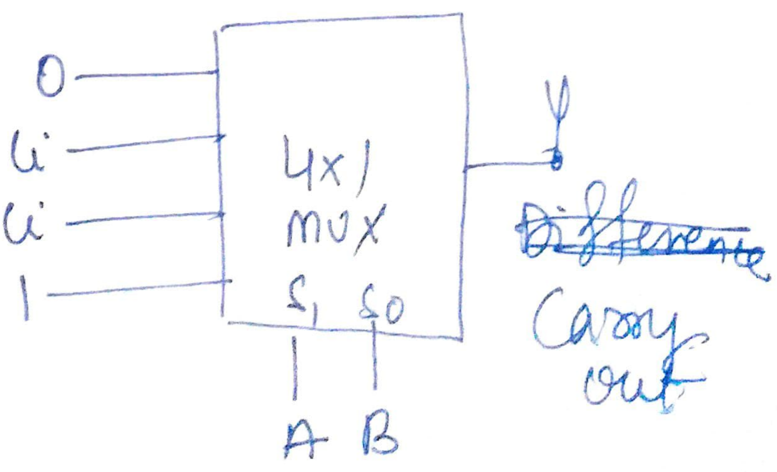
Sum

A \ BCi	00	01	11	10
0		1		1
1	1		1	

Carry

A \ BCi	00	01	11	10
0				1
1		1	1	1

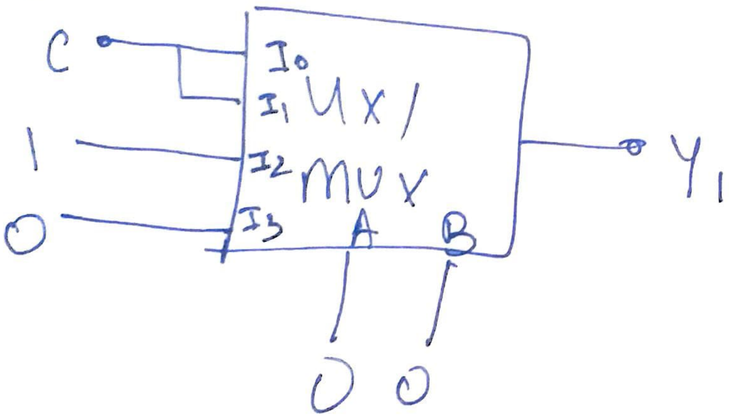




A	B	S
0	0	$I_0 = C_i$
0	1	$I_1 = \overline{C_i}$
1	0	$I_2 = \overline{C_i}$
1	1	$I_3 = C_i$

Derive the logical Expression.

Exi

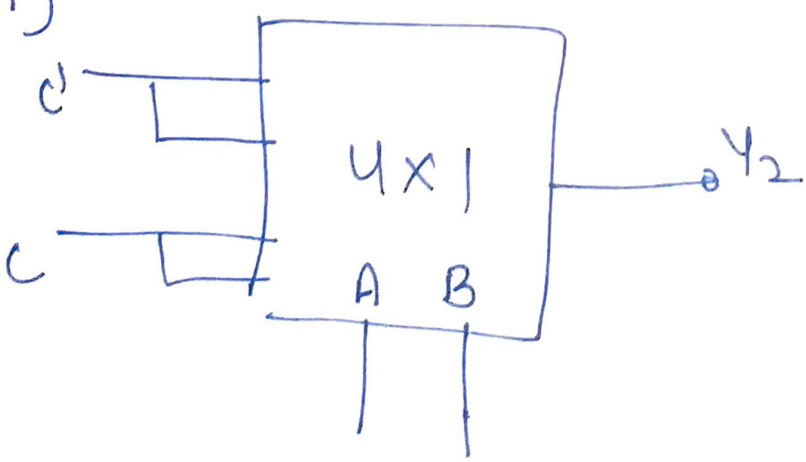


A	B	Y
0	0	C
0	1	C
1	0	1
1	1	0

$$Y_1 = \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}\cdot 1 + \cancel{(A\cdot B\cdot 0)}$$

$$= A'C\,[\cancel{\bar{B}+B}] + A\bar{B} = A'C + A\bar{B}$$

ii)



$= Y_2 = A \odot C$