CSE260

Lab Report 02

Section: 03 B

Table: 5

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Experiment # 4 : Design and Implementation of 4-bit Parallel Binary Adder

Experiment # 5 : Implementation of 4-bit Magnitude Comparator

Experiment # 6 : Design circuits using encoder & decoder

Experiment # 7 : Function Implementation using MUX

Required Components for Lab-4:

1. IC 7408
2. IC 7432
3. IC 7486
4. IC 7483

Required components for Lab-5:

1. IC 7408
2. IC 7432
3. IC 7404
4. IC 4077

Required components for Lab-6:

1. IC 74138
2. IC 74148

Required components for Lab-7:

1. IC 74153
2. IC 7408
3. IC 7432
4. IC 7404

The experimental setup are attached in next pages.

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Lab-4

Section-3B

Table-5:

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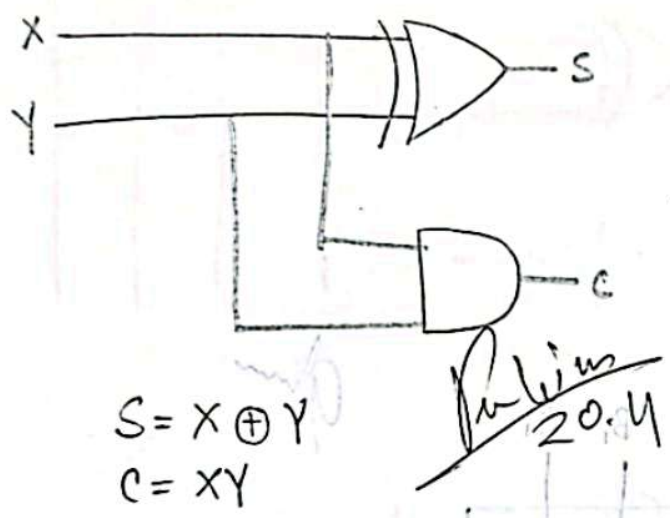
Half Adder Circuit:

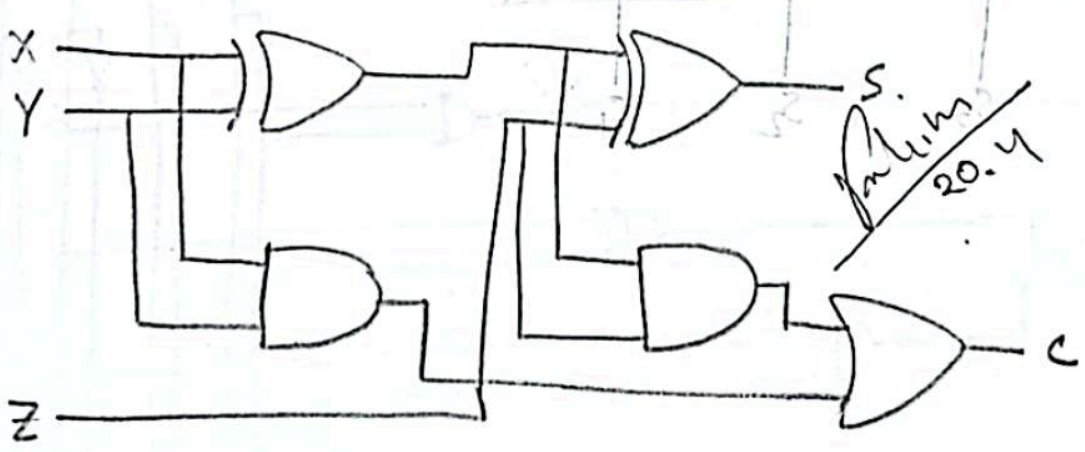


X	Y	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

$S = X \oplus Y$

$C = XY$

Full Adder Circuit:

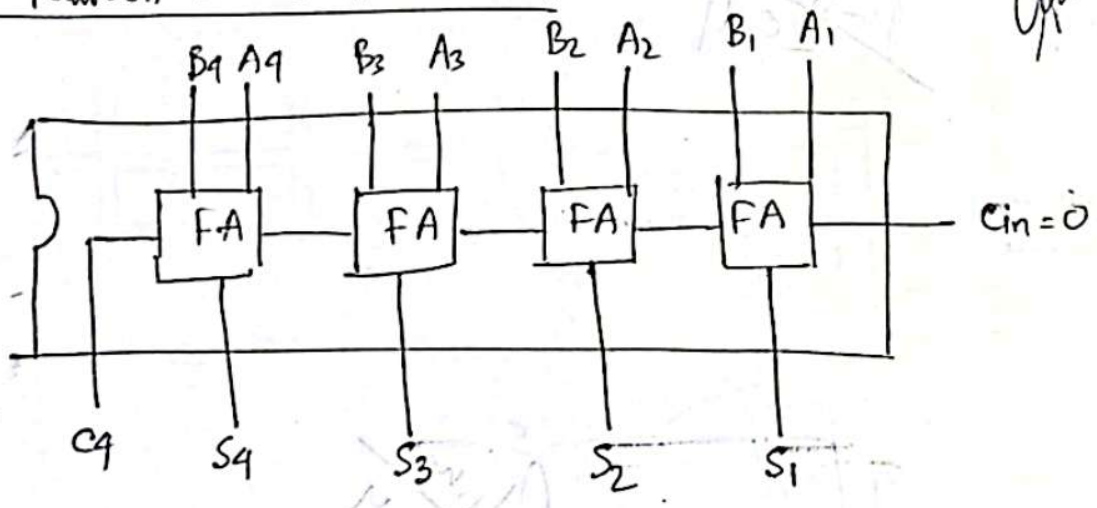


$C = XY + (X \oplus Y)Z$

$S = (X \oplus Y) \oplus Z$

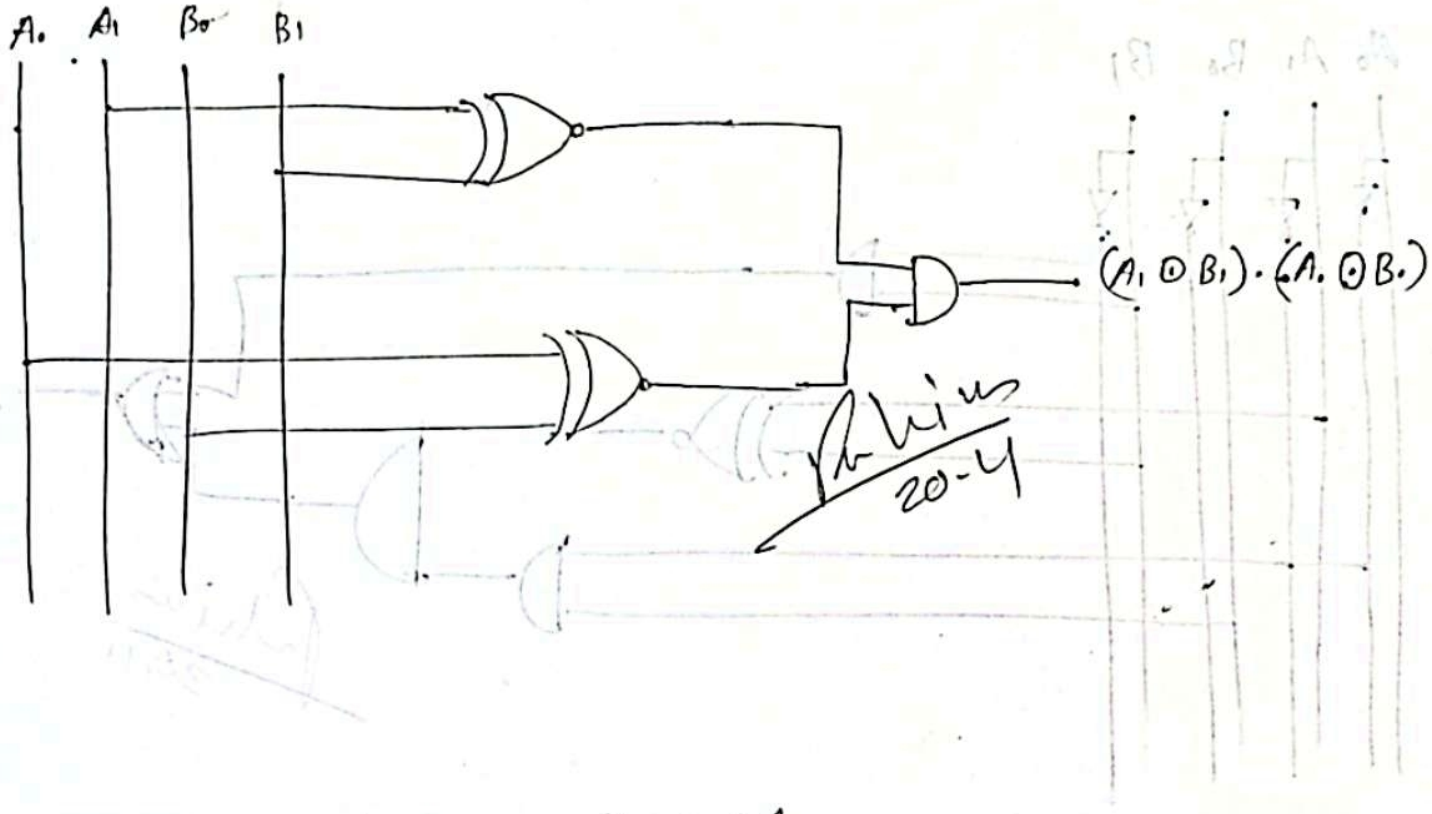
x	y	z	c	s
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

A four-bit Parallel adder circuit:

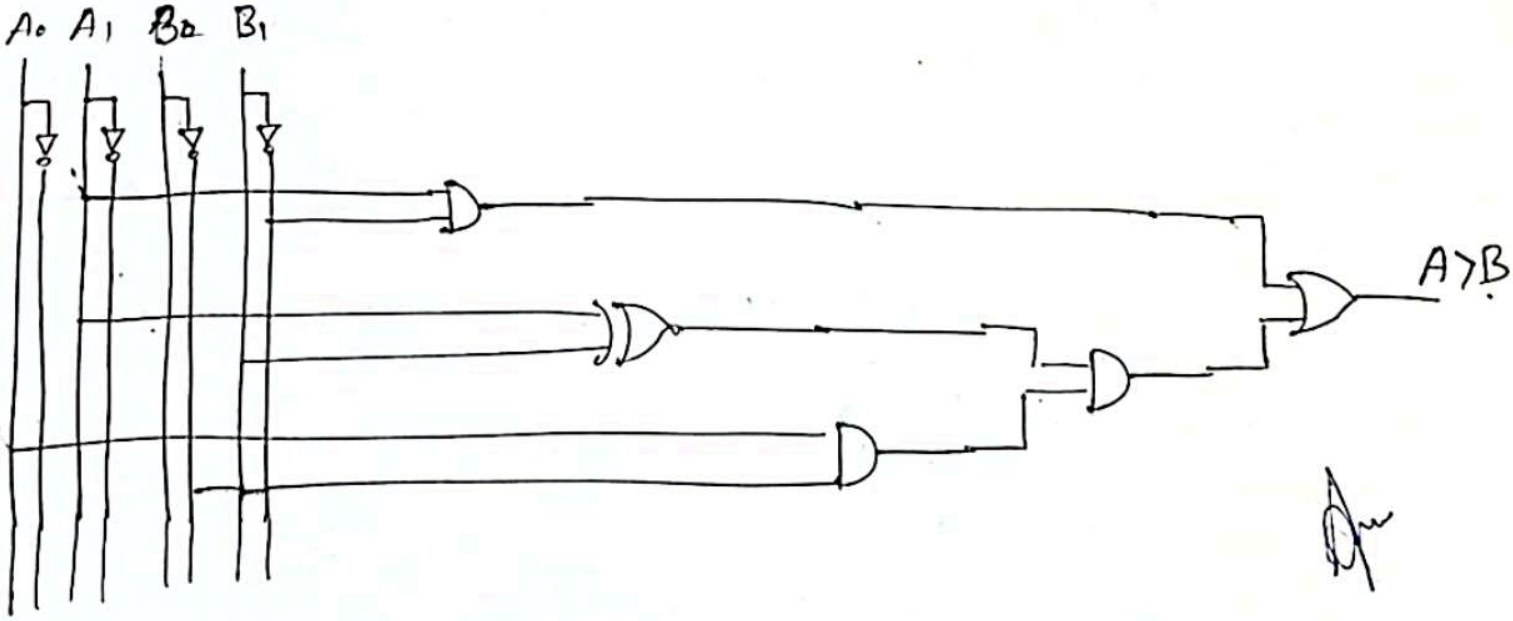


Experiment 5

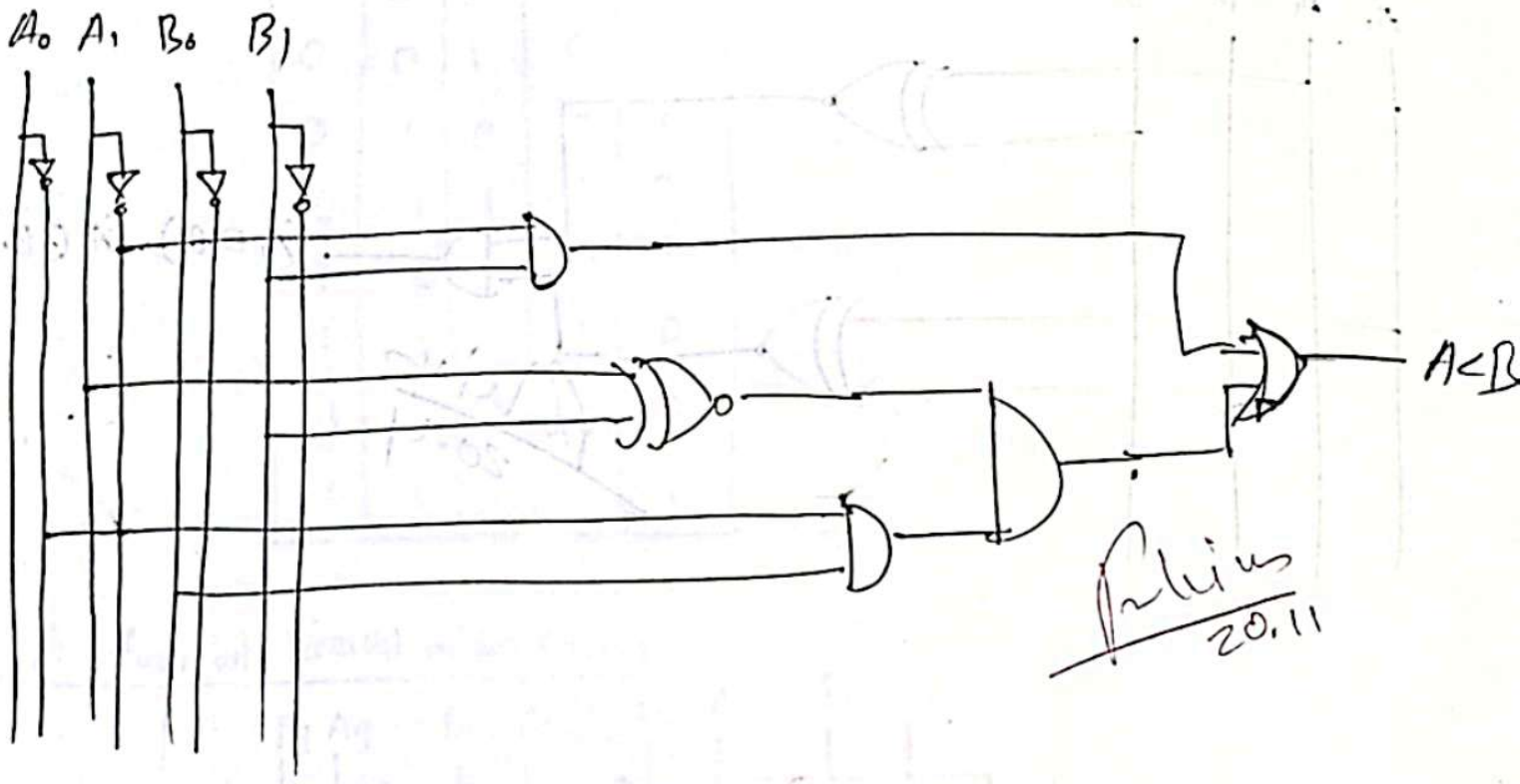
1. $A == B \Rightarrow (A_1 \odot B_1) \cdot (A_0 \odot B_0)$



2. $A > B \Rightarrow A_1 B_1' + (A_1 \odot B_1) \cdot A_0 B_0'$



3. $A<B \Rightarrow A_1'B_1 + (A_1 \odot B_1) \cdot A_0'B_0$



Experiment-6

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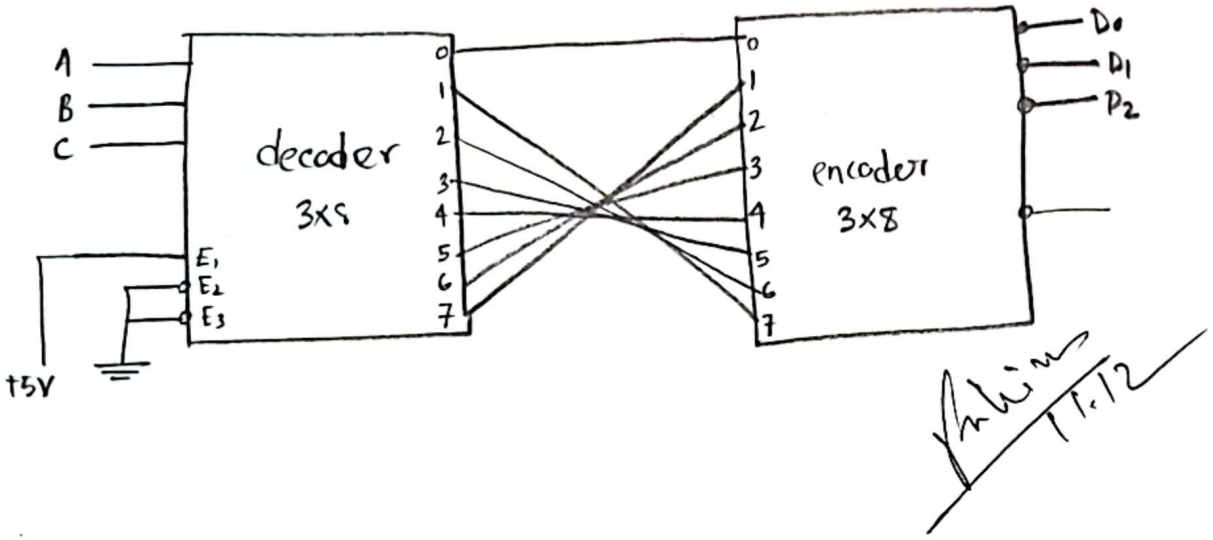

Lab-7

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Table-5
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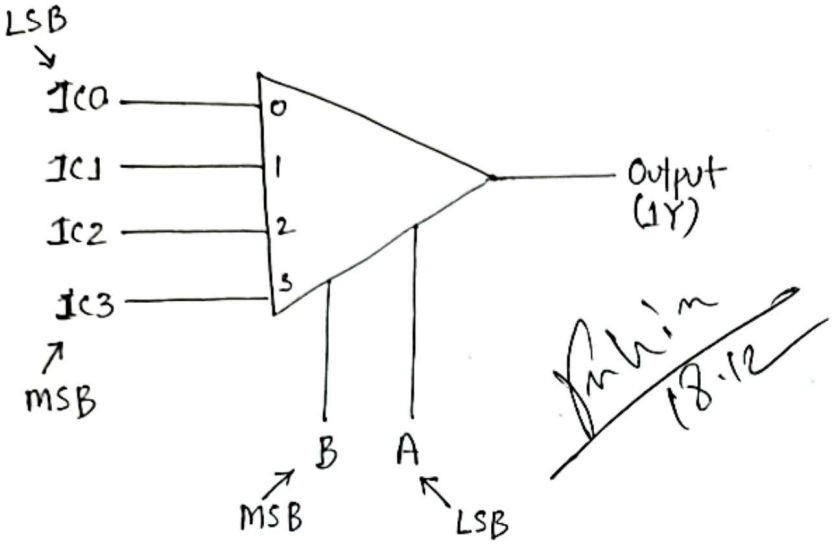
Task1:

(4x1) MUX:



Task2:

$F(A, B, C, D) = \Sigma(1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13)$

Table for variable A and B

	I0	I1	I2	I3
A'B'	0	1	2	3
A'B	4	5	6	7
AB'	8	9	10	11
AB	12	13	14	15

1

$\therefore I0 = B$

$I1 = 1$

$I2 = A'$

$I3 = A' + B'$

$A'B' + AB$

$= B(A' + A)$

$= B$

$A'B' + A'B$

$= A'(B' + B)$

$= A'$

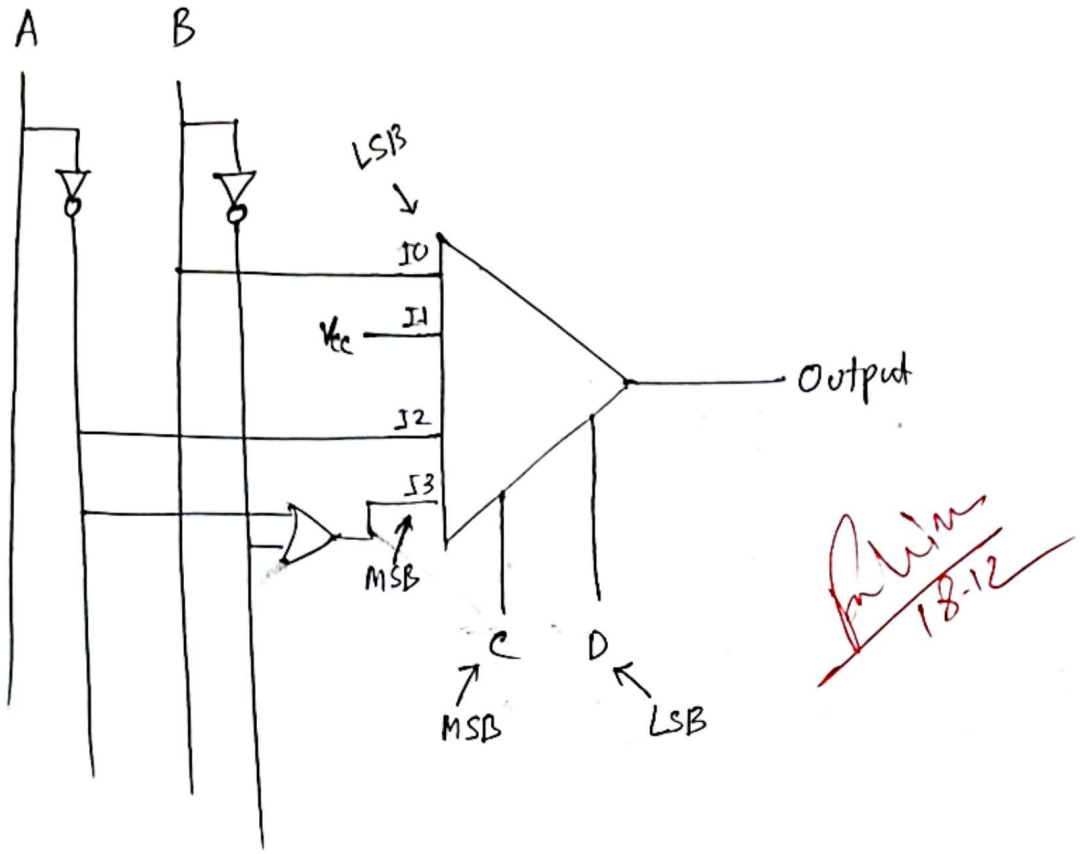
$A'B' + A'B + AB'$

$= A'(B' + B) + AB'$

$= A' + AB'$

$= (A' + A)(A' + B')$

$= A' + B'$

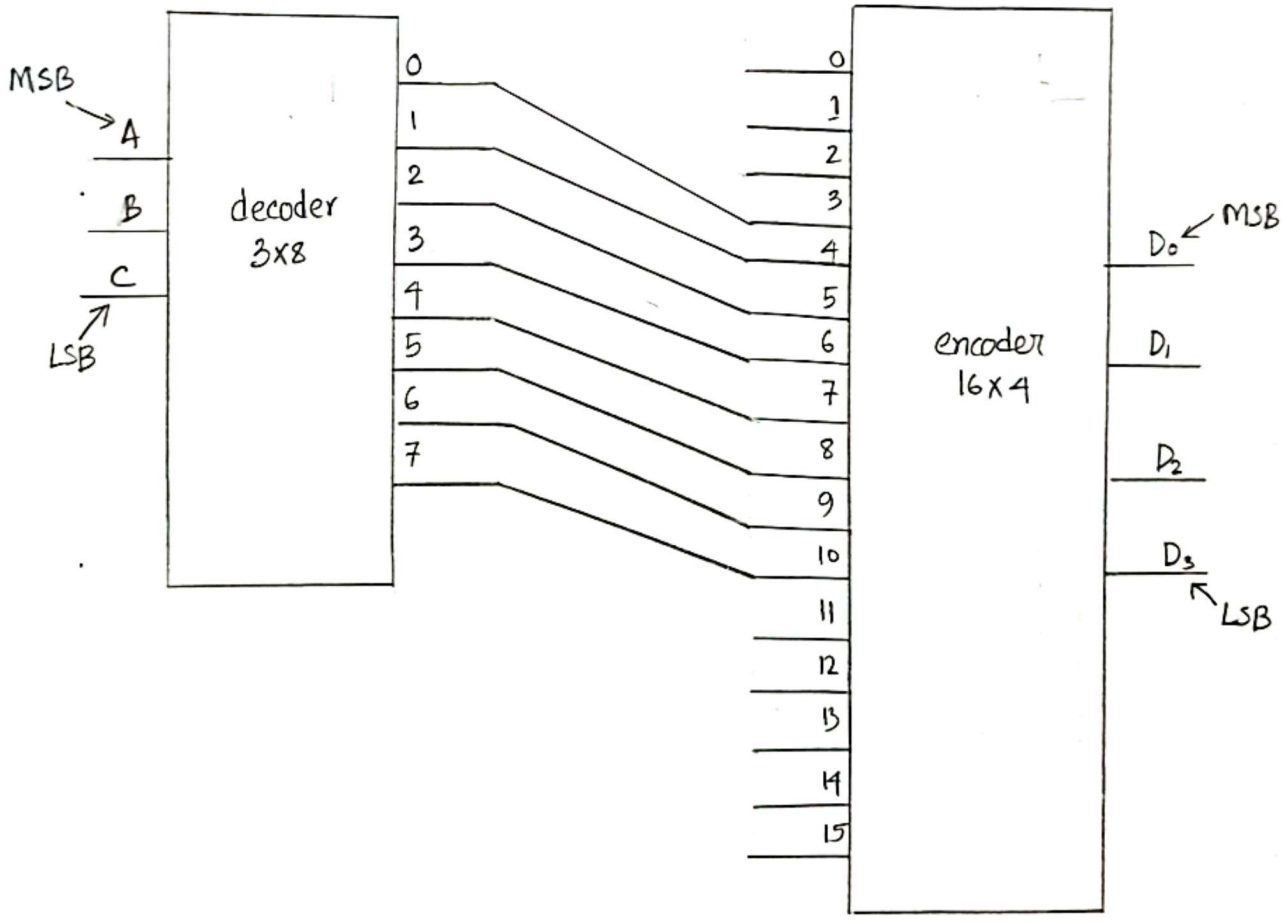


18.12

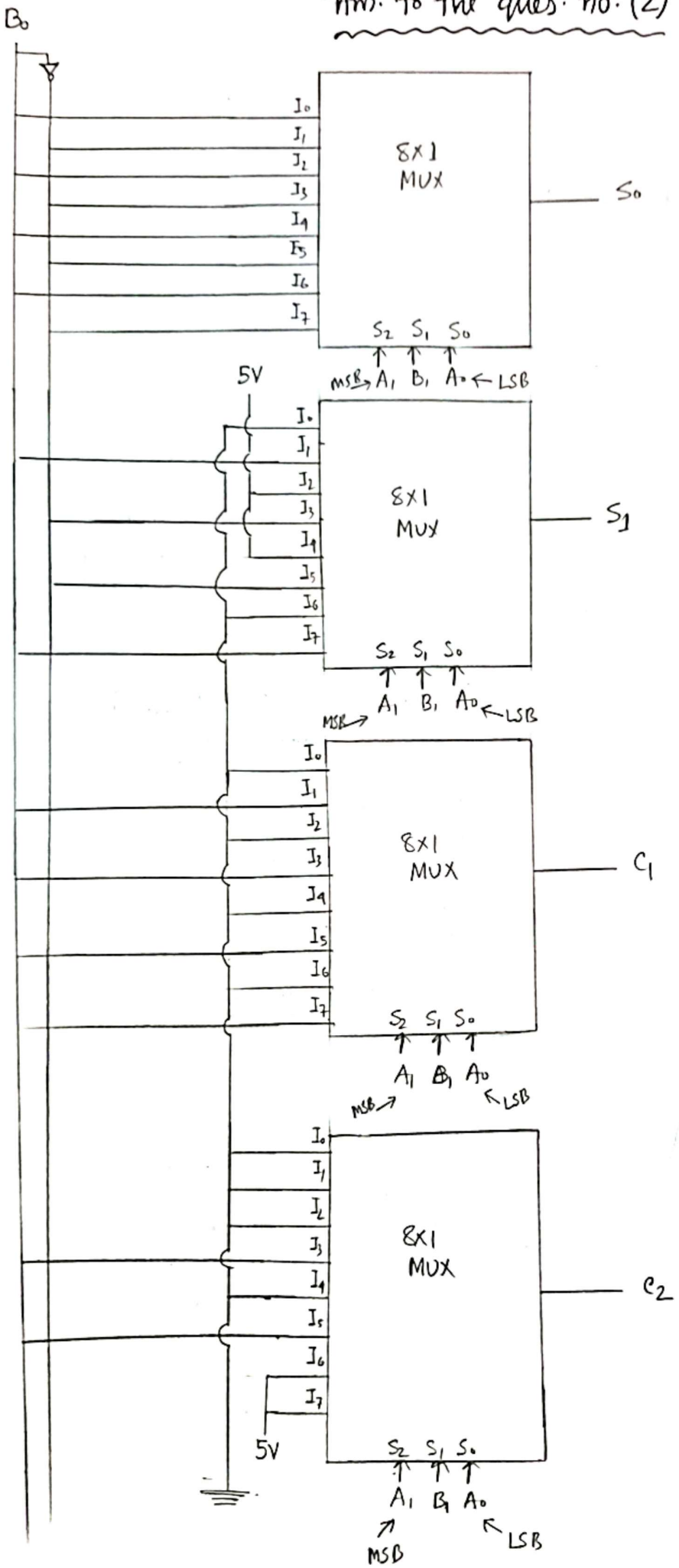
"Ans. to the ques no. (1)"

Truth Table:

Inputs				Excess-3 Outputs				
Minterm	A	B	C	Minterm	D_0	D_1	D_2	D_3
0	0	0	0	3	0	0	1	1
1	0	0	1	4	0	1	0	0
2	0	1	0	5	0	1	0	1
3	0	1	1	6	0	1	1	0
4	1	0	0	7	0	1	1	1
5	1	0	1	8	1	0	0	0
6	1	1	0	9	1	0	0	1
7	1	1	1	10	1	0	1	0



"Ans. to the ques. no. (2)"



Truth Table:

A_1	B_1	A_0	B_0	S_0	S_1	C_1	C_2
0	0	0	0	$0/B_0$	0	0	0
0	0	0	1	$1/B_0$	0	0	0
0	0	1	0	$1/B_0'$	$0/B_0$	$0/B_0$	0
0	0	1	1	$0/B_0'$	$1/B_0$	$1/B_0$	0
0	1	0	0	$0/B_0$	1	0	0
0	1	0	1	$1/B_0$	1	0	0
0	1	1	0	$1/B_0'$	$1/B_0'$	$0/B_0$	$0/B_0$
0	1	1	1	$0/B_0'$	$0/B_0'$	$1/B_0$	$1/B_0$
1	0	0	0	$0/B_0$	1	0	0
1	0	0	1	$1/B_0$	1	0	0
1	0	1	0	$1/B_0'$	$1/B_0'$	$0/B_0$	$0/B_0$
1	0	1	1	$0/B_0'$	$0/B_0'$	$1/B_0$	$1/B_0$
1	1	0	0	$0/B_0$	0	0	1
1	1	0	1	$1/B_0$	0	0	1
1	1	1	0	$1/B_0'$	$0/B_0$	$0/B_0$	1
1	1	1	1	$0/B_0'$	$1/B_0$	$1/B_0$	1