CSE 260
Assignment 04

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sec : 1

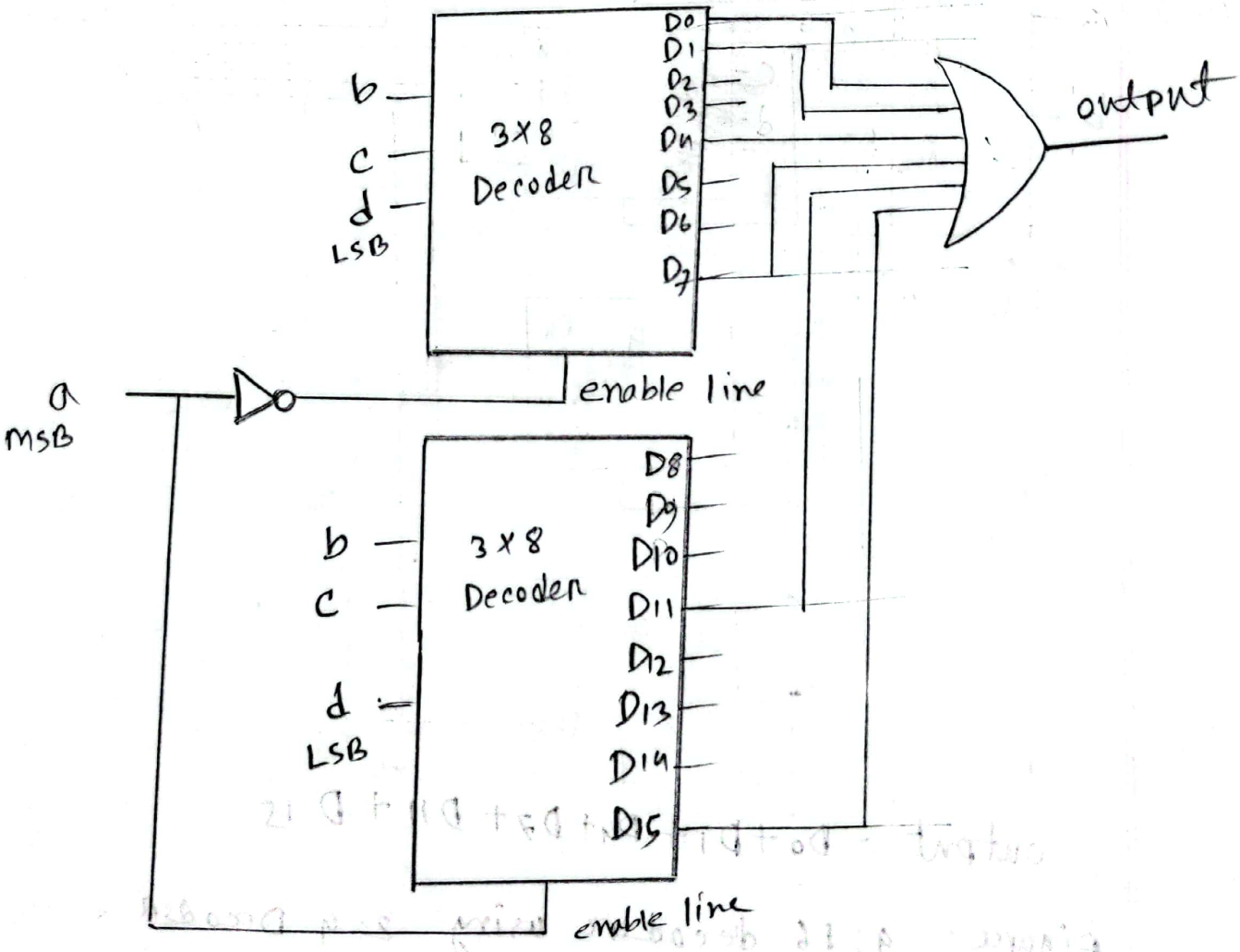
Ans to the qr no 1

Given function, $F(a,b,c,d) = \Sigma(0,1,4,7,11,15)$

a

Here, a is MSB and d is LSB.

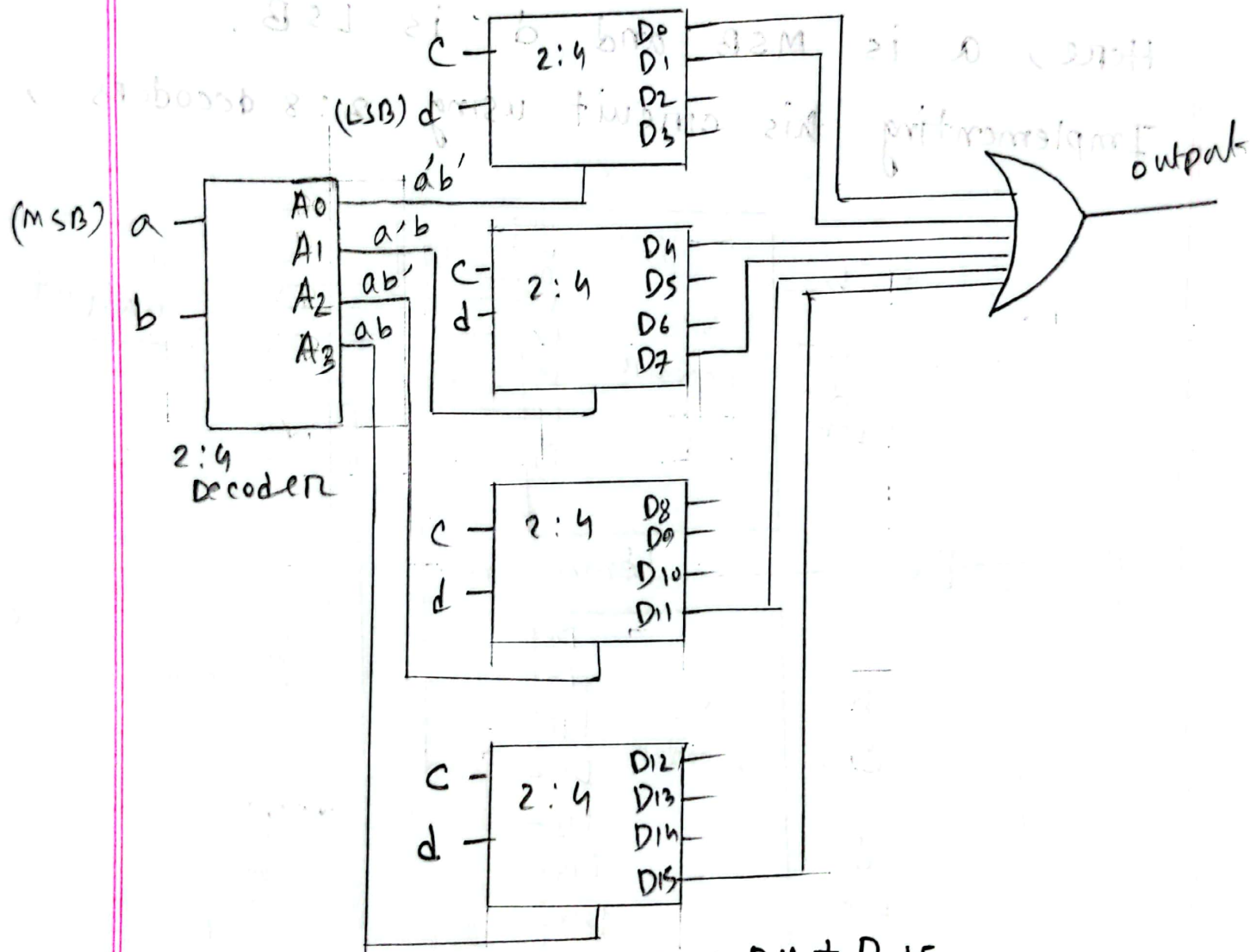
Implementing this circuit using 3:8 decoders,



(b)

Implementation of the boolean function, $F(a,b,c,d) = \Sigma(0,1,4,7,11,15)$ using 2:4 Decoders.

Here, a is MSB and d is LSB.



$\therefore$ output $= D_0 + D_1 + D_4 + D_7 + D_{11} + D_{15}$

Figure: 4:16 decoder using 2:4 Decoder.

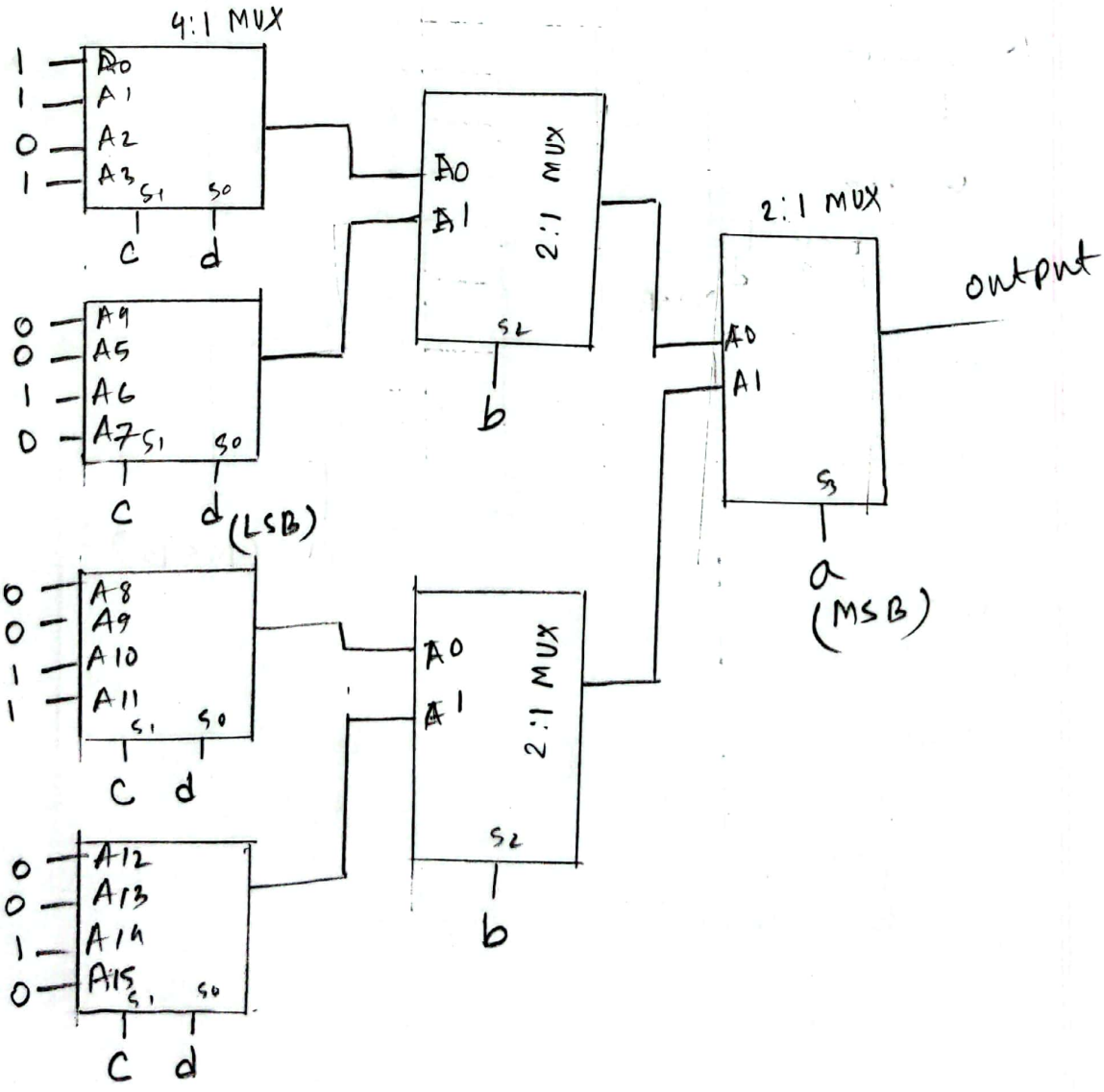
Ans to the qr no 2

Given, $F(a,b,c,d) = \Sigma(0,1,3,6,10,11,14)$

a

Implementing the given function using 4:1 and 2:1 MUXs both in the same circuit.

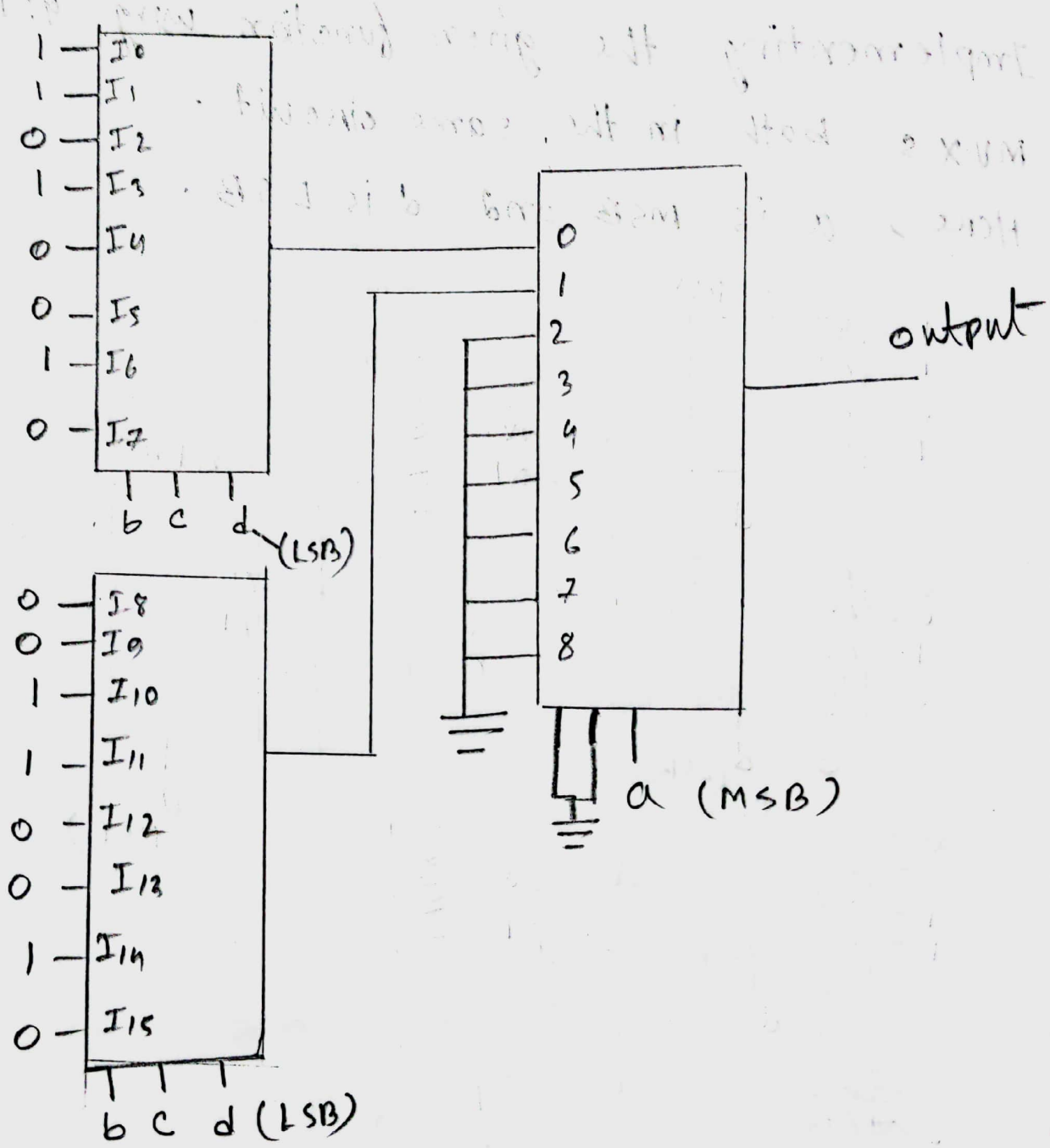
Here, a is MSB and d is LSB.



(b)

Implementing $F(a,b,c,d) = \Sigma(0,1,3,6,10,11,14)$ using only 8 : 1 MUX :

Here, a is MSB and d is LSB

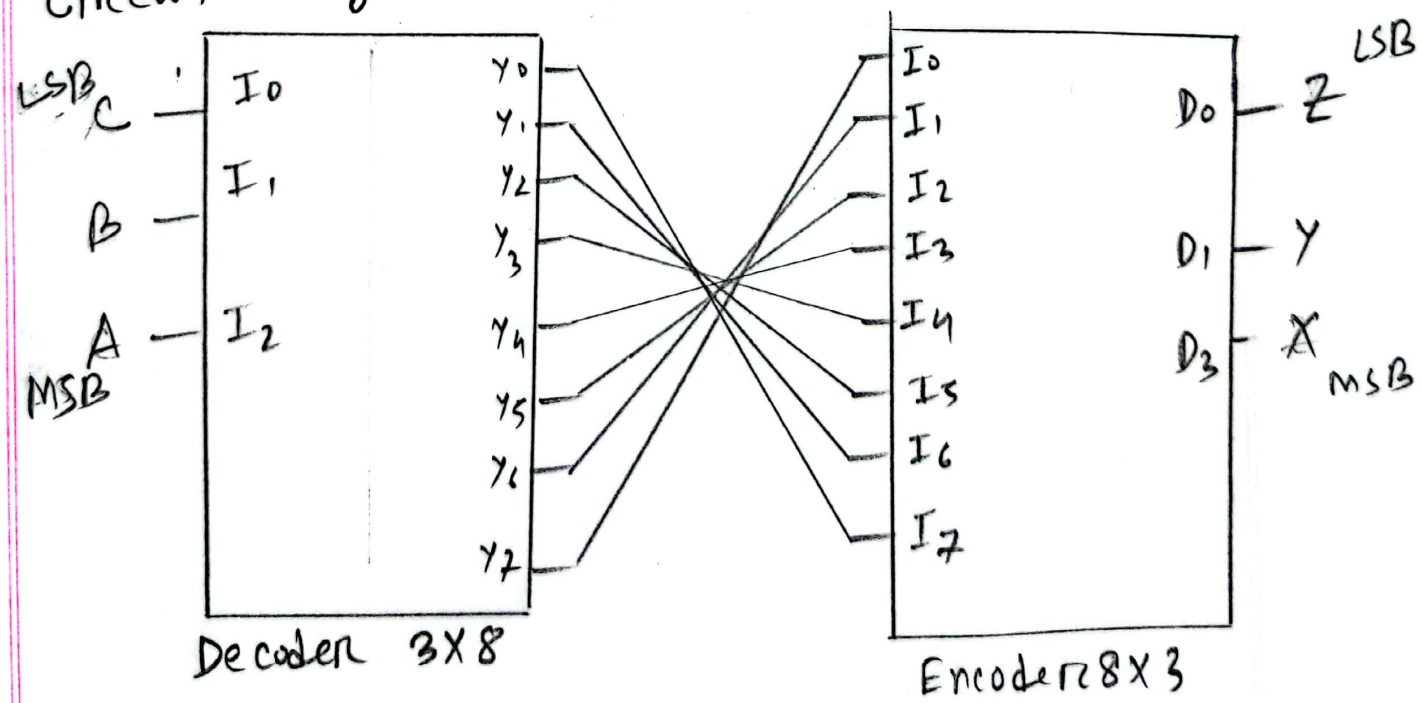


Ans to the qr no 3

Truth table for 1's complement of 3 bit numbers using encoder and decoder.

Input				output			
min	A	B	C	min	X	Y	Z
0	0	0	0	7	1	1	1
1	0	0	1	6	1	1	0
2	0	1	0	5	1	0	1
3	0	1	1	4	1	0	0
4	1	0	0	3	0	1	1
5	1	0	1	2	0	1	0
6	1	1	0	1	0	0	1
7	1	1	1	0	0	0	0

Circuit diagram :



The given circuit takes 3 inputs in the decoder. Then as the decoder gives 1 in output according to given min terms 3 bit binary input, that corresponding pin to connected to the 1's compliment value ~~binary~~ minterm pin in encoder so that it passes 1 through that pin and output is given in the encoder.