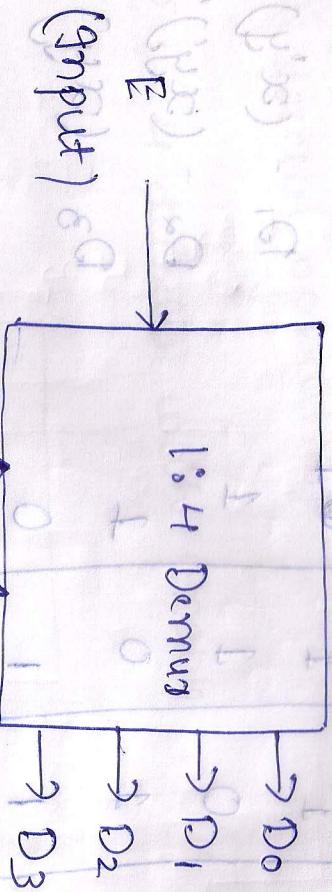


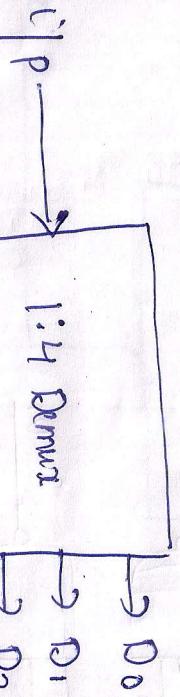
08/04/2015

Demultiplexer:-



Select lines

Multiplexing



If I/p is 0.

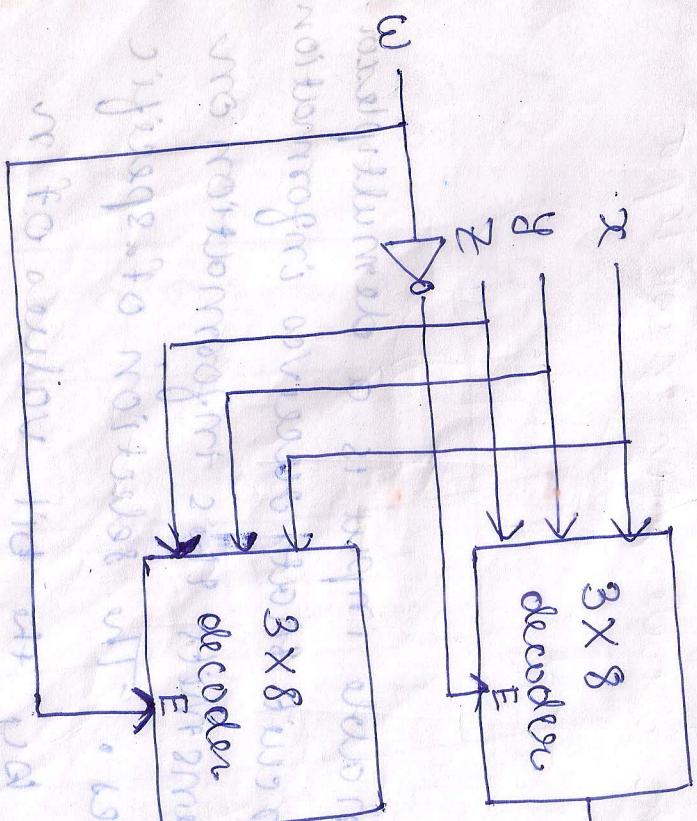
new lines will select

output

If A,B = 0,0 then D

If I/p is 1,
If A,B = 0,0 then

Select lines



when we
will show
1st dec
will show
12345678
for output
1st
2nd
3rd
4th
5th
6th
7th
8th

Decoder and demultiplexer circuits can be connected together to form a larger decoder circuit. The fig. shows two 3x8 decoders with enable inputs connected to form a 4-to-16 decoder.

Encoders :-

An encoder is a digital function that produces a inverse operation from that of a decoder. An encoder has 2^n (or less input lines) and n output lines. The output lines generate the binary code for the 2^n input variables.

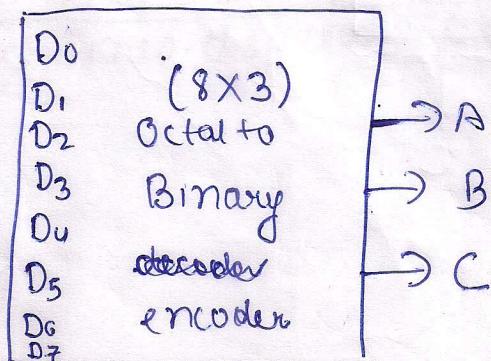
Octal to Binary encoder

	A	B	C	-	0 0 0
D ₀ 0	0				0 0 0
D ₁ 1	1				0 0 1
D ₂ 2	0	1	0		0 1 0
D ₃ 3	0	1	1		0 1 1
D ₄ 4	1	0	0		1 0 0
D ₅ 5	1	0	1		1 0 1
D ₆ 6	1	1	0		1 1 0
D ₇ 7	1	1	1		1 1 1

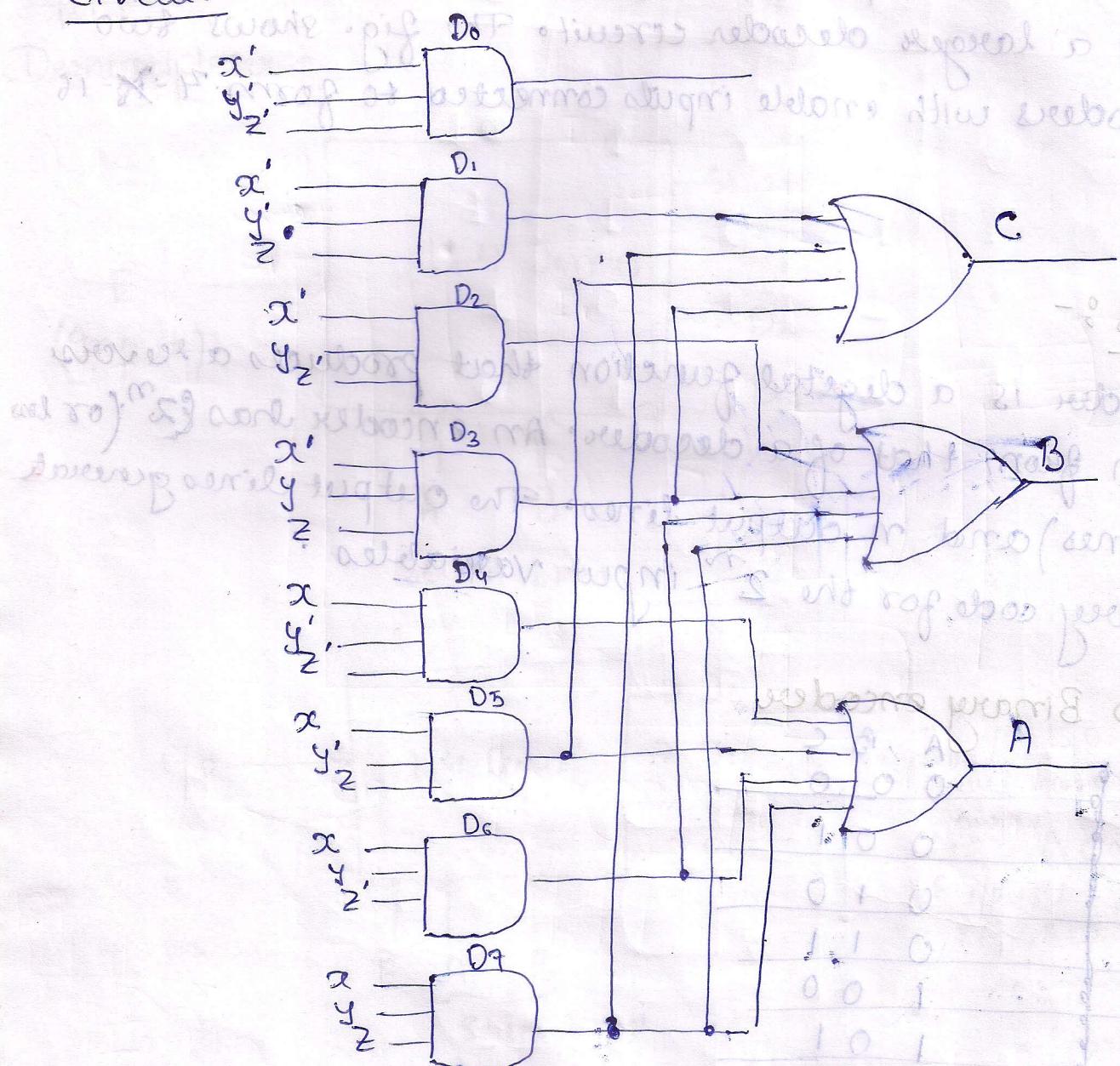
$$A = D_4 + D_5 + D_6 + D_7$$

$$B = D_2 + D_3 + D_6 + D_7$$

$$C = D_1 + D_3 + D_5 + D_7$$



Circuit



0	0	0	0
1	1	0	0
0	0	1	0
1	0	1	0
0	1	1	0
1	1	1	0

$$fD + gD + hD + \mu D = A$$

$$fD + gD + hD + \mu D = B$$

$$fD + gD + hD + \mu D = C$$

(8x8)	0	1
0 + 101	0	1
100	1	0
001	0	1
101	1	0
011	0	1
111	1	1

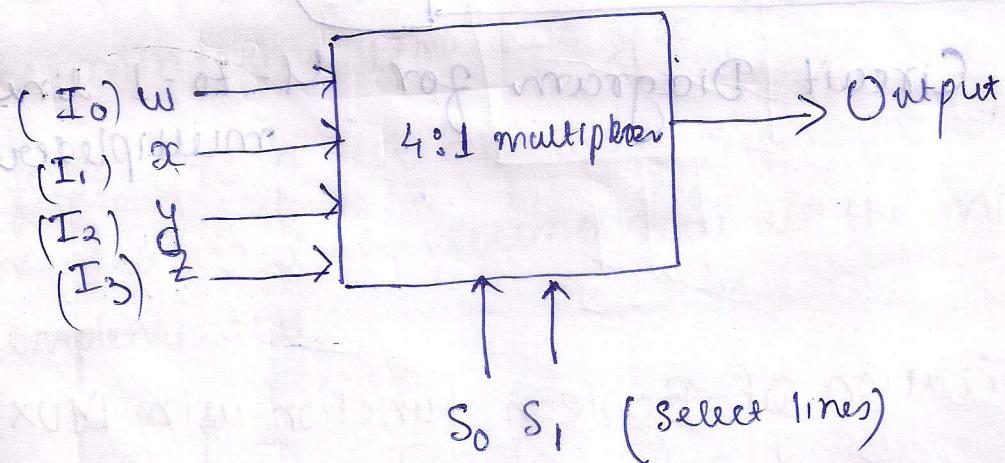
Multiplexer:-

Multiplexing means transmitting a large no. of information units over a smaller number of channels or lines.

A digital multiplexer is a combination circuit that selects binary information from one of many input lines and directs it to a single output line. The selection of a particular input line is controlled by a set of selection lines.

difference between multiplexer and demux

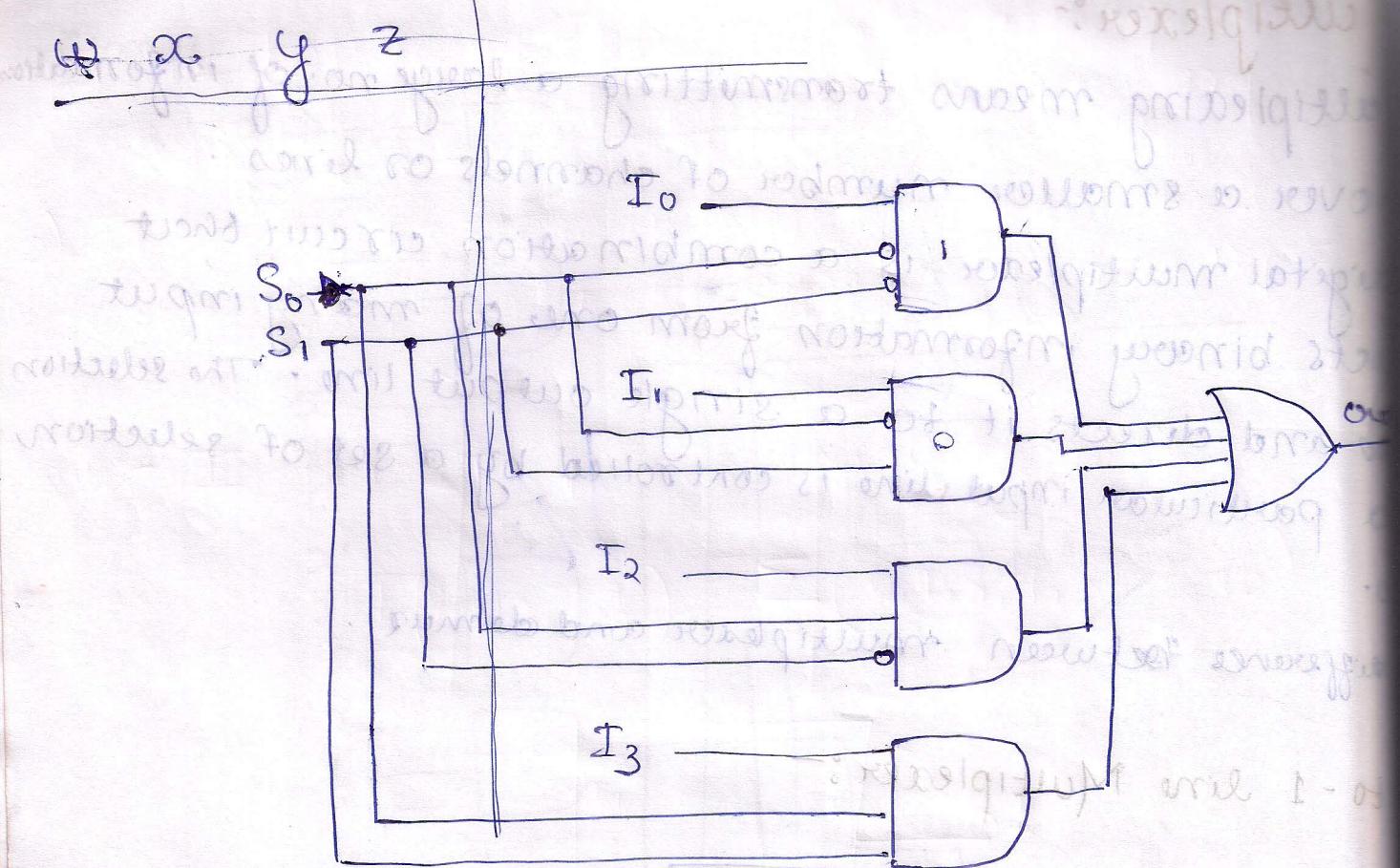
4-to-1 line Multiplexer:-



Select lines		Output
S_0	S_1	
0	0	I_0
0	1	I_1
1	0	I_2
1	1	I_3

Implementation Table

The no. of select lines depends on the no. of inputs

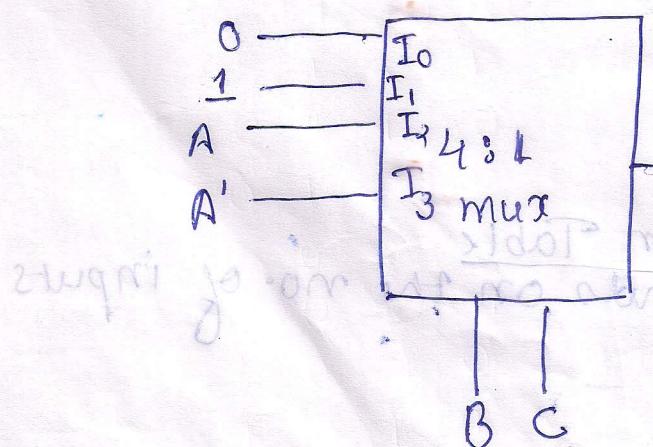


Circuit Diagram for 4-to-1 line multiplexer

10/04/2015

Implementation of Boolean function using MUX:-

$$F(A, B, C) = \sum(1, 3, 5, 6)$$



01	0	0
11	1	0
10	0	1
00	1	1

Truth Table:

	A'	A	I_0	I_1	I_2	I_3	
	0	0	0	0	0	0	0
	0	0	0	0	1	1	1
	0	0	0	1	0	0	0
	0	0	0	1	1	1	1
	0	1	0	0	0	0	0
	0	1	0	1	0	1	1
	0	1	1	0	0	1	0
	0	1	1	1	1	1	0

Steps:

1. List the input of the multiplexer and under them class all the minterms into two groups.
2. The first group list all those minterms where A is complemented and the second group all the minterms with A uncomplemented.

	I_0	I_1	I_2	I_3
\bar{A}	0	1	2	3
A	4	5	6	7

Implementation Table

- 1) Circle all the minterms of the function.
- 2) If the two minterms in a column are not circled, apply 0 to the corresponding multiplexer input.
- 3) If the two minterms are circled, apply 1 to the corresponding mux input.

v) If the bottom manometer is circled and top is not circled, apply A to the corresponding man input

5) If the top minterm is circled and bottom is not circled, apply A' to the corresponding maz input

Ques:- Implement the function using mux

$$F(A, B, C, D) = \sum (0, 1, 3, 4, 8, 9, 15)$$

