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Roll 20P-0640

Manual # 09

Experiment performed.

Multiplexer

Types of multiplexer

De-multiplexer

Types of De-multiplexer

Applications of multiplexer & De-multiplexer

Objective

The objective of this lab is to understand how to make different multiplexer and Demultiplexer can be obtained and used by using different logic gates by IC's

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Used equipments

Wires

Bread Board

Digital experimental board

Logic gates

Battery

Used software

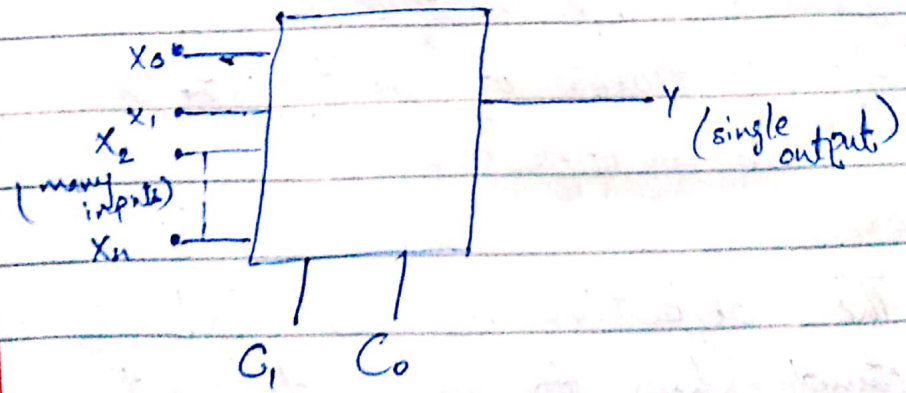
Multisim

Logic ly

Multiplexer

Multiplexer is a device that has multiple inputs & ~~outputs~~ single line output

Multiplexer is also called as Mux



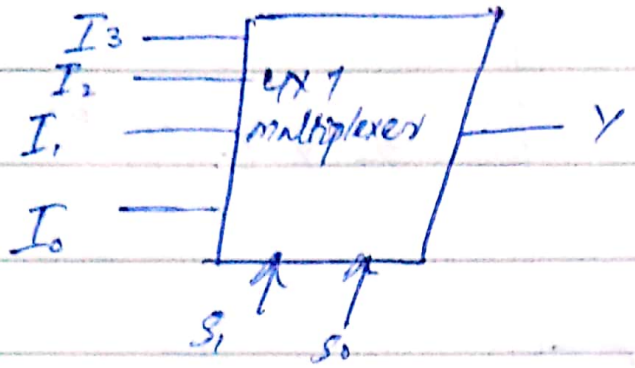
Types 4x1 Mux

8x1 Mux

16x1 Mux

4X1 Mux

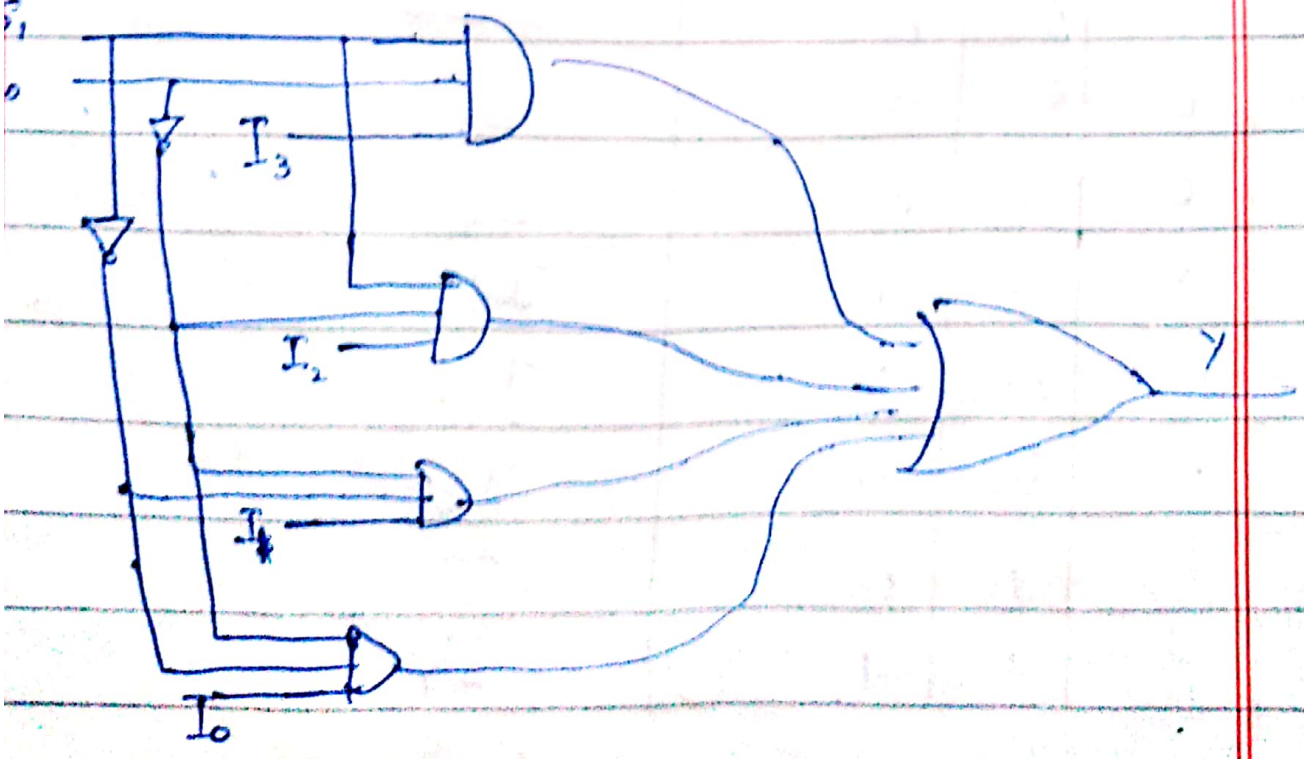
4x1 multiplexer has four inputs I_3, I_2, I_1 & I_0. Two selection lines S_1 & S_0 and one output Y.



Truth table

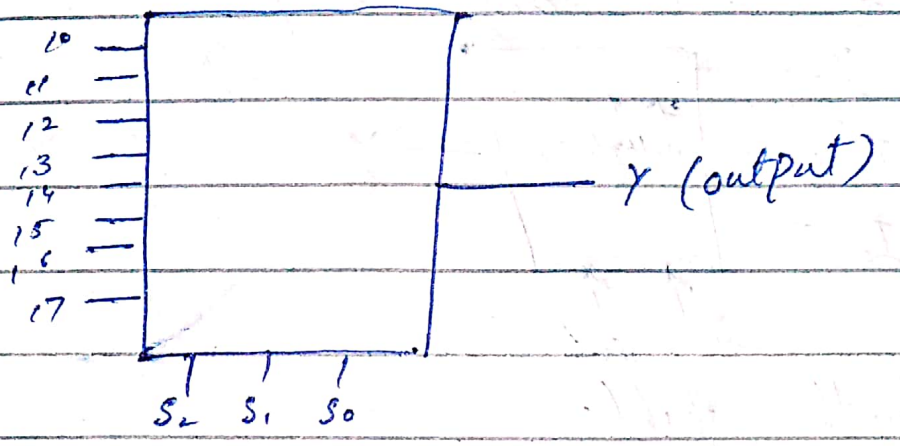
S_1	S_0	Y
0	0	I_0
0	1	I_1
1	0	I_2
1	1	I_3

4X1 Mux Diagram



8×1 multiplexer

It has 8 inputs and 1 output having three selection lines S_2, S_1 & S_0



Expression

$$Y = S_2'S_2'S_0'I_0 + S_2'S_1'S_0I_1 + S_2'S_1S_0'I_2 + S_2'S_1S_0I_3 + S_2S_1'S_0'I_4 + S_2S_1'S_0I_5 + S_2S_1S_0'I_6 + S_2S_1S_0I_7$$

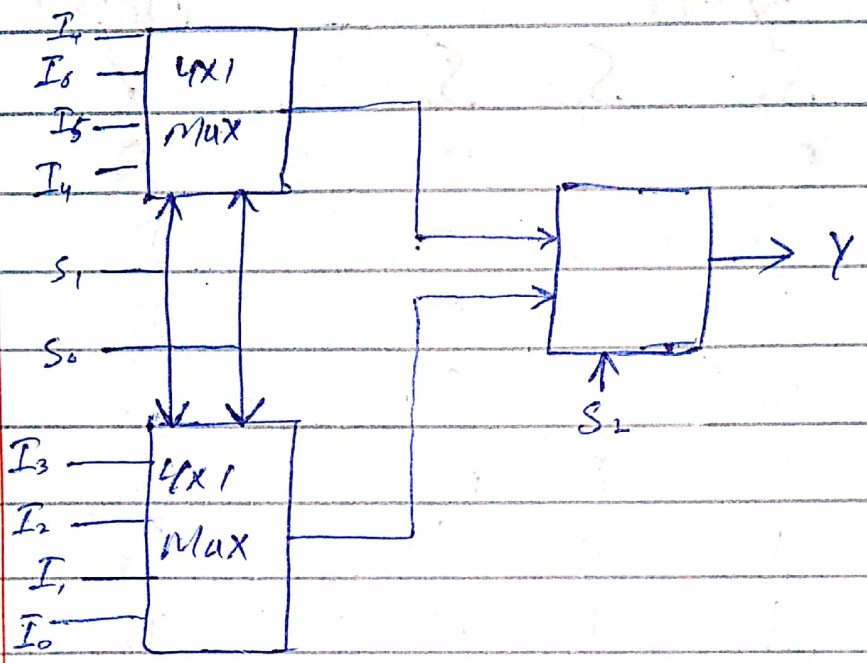
Truth table

input			output
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

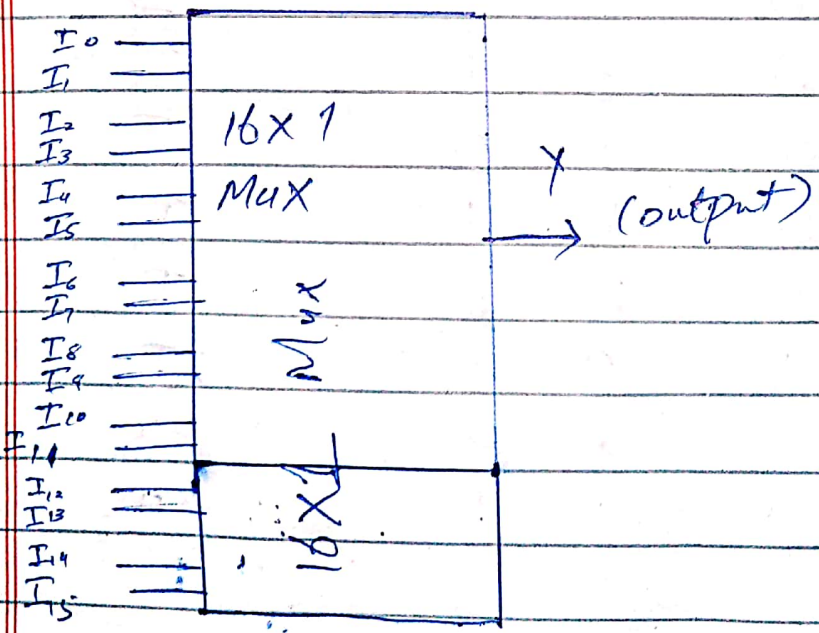
Date: / /

Mon Tue Wed Thu Fri Sat

MUX



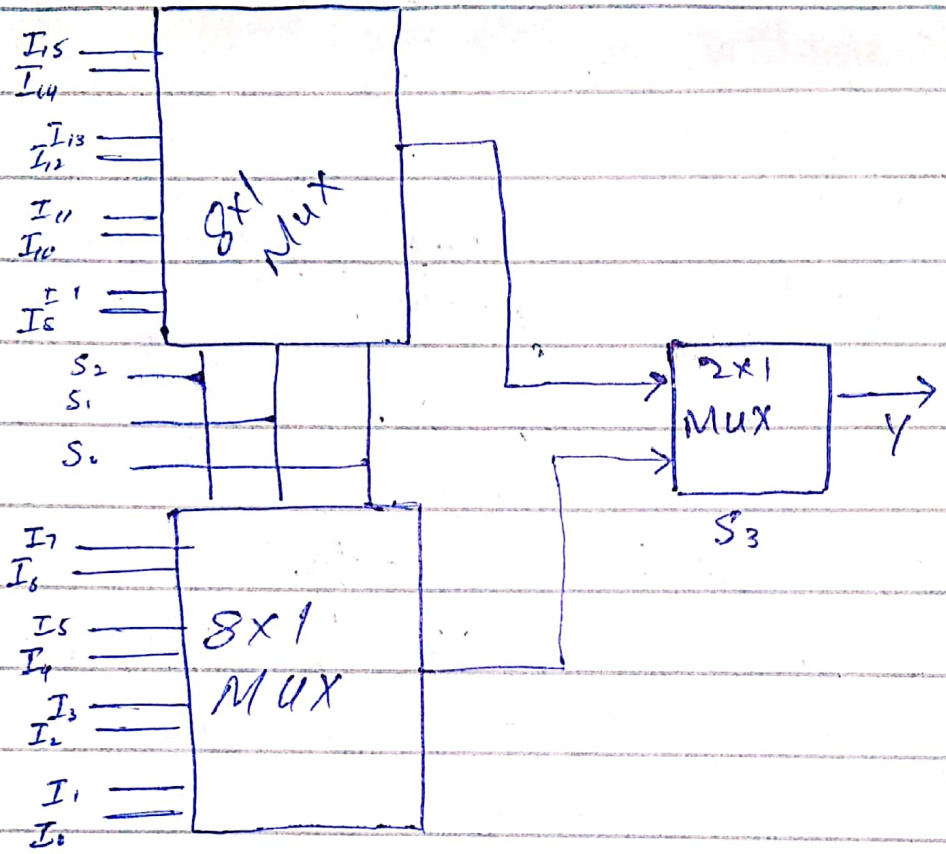
16X1 Mux



Mux Truth table

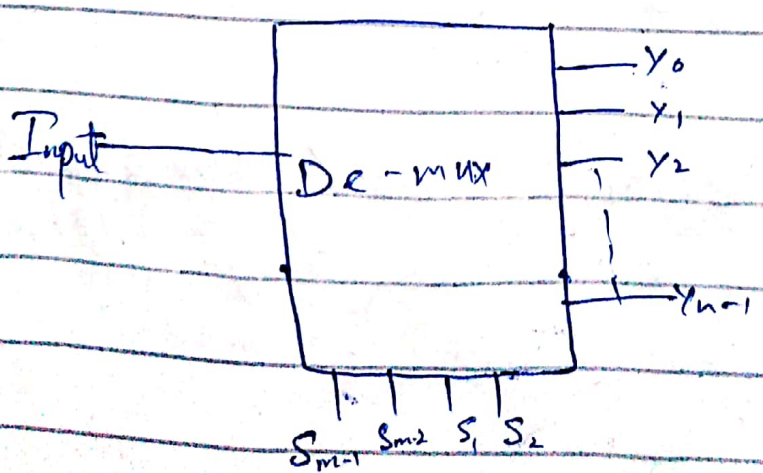
Selection inputs				Output
S_3	S_2	S_1	S_0	Y
0	0	0	0	I_0
0	0	0	1	I_1
0	0	1	0	I_2
0	0	1	1	I_3
0	1	0	0	I_4
0	1	0	1	I_5
0	1	1	0	I_6
0	1	1	1	I_7
1	0	0	0	I_8
1	0	0	1	I_9
1	0	1	0	I_{10}
1	0	1	1	I_{11}
1	1	0	0	I_{12}
1	1	0	1	I_{13}
1	1	1	0	I_{14}
1	1	1	1	I_{15}

16 x 1 Mux



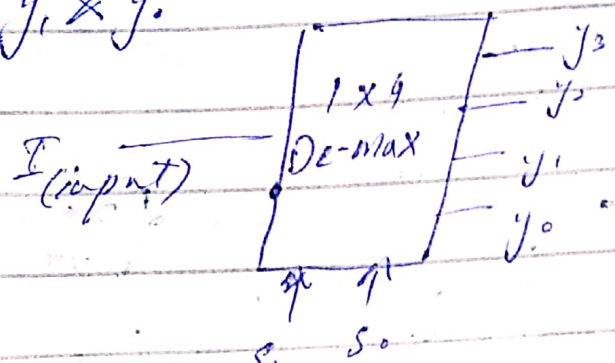
Demultiplexer

Function of De-multiplexer is in contrast to multiplexer function. It takes information from one line & distributes it to a given number of output line It is also called Data Distributor.



1x4 De-mux

1x4 De-mux has one input I, two selection lines S_1 & S_0 and four output Y_3, Y_2, Y_1 & Y_0.



Selection Input		output			
S_1	S_0	Y_3	Y_2	Y_1	Y_0
0	0	0	0	0	1
0	1	0	0	1	0
1	0	0	1	0	0
1	1	1	0	0	0

1 x 4 De-Mux Diagram

$Y_3 = S_1 S_0 I$

$Y_2 = S_1 S_0 I$

$Y_1 = S_1 S_0 I$

$Y_0 = S_1' S_0 I$

Conclusion

After studing about Mux & De-Mux we are able to design them and use them into determine devices.