UNIVERSITY OF ASIA PACIFIC

Department of Computer Science & Engineering

Course Title – Digital Logic & System Design Lab

Course Code – CSE 210

Experiment No. – 07

Experiment name – Implementation of MUX (74151 & 74153)

SUBMITTED BY

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PROBLEM STATEMENT:

a) Test and verify the 8-input and 4-input MUX(IC# 74151 & 74153).
b) Design and implement a 4-bit Logic unit using a MUX.

OBJECTIVE: The objective of the experiment is to analyse Multiplexer, test and verify 8:1 MUX & designing, implementation of 4-bit Logic Unit.

APPARATUS:

- IC-7408(AND Gate)
- IC-7432(OR Gate)
- IC-7404(NOT Gate)
- IC-7486(X-OR)
- IC-74151
- IC-74153
- Logic Display
- Logic Switch

INTRODUCTION:

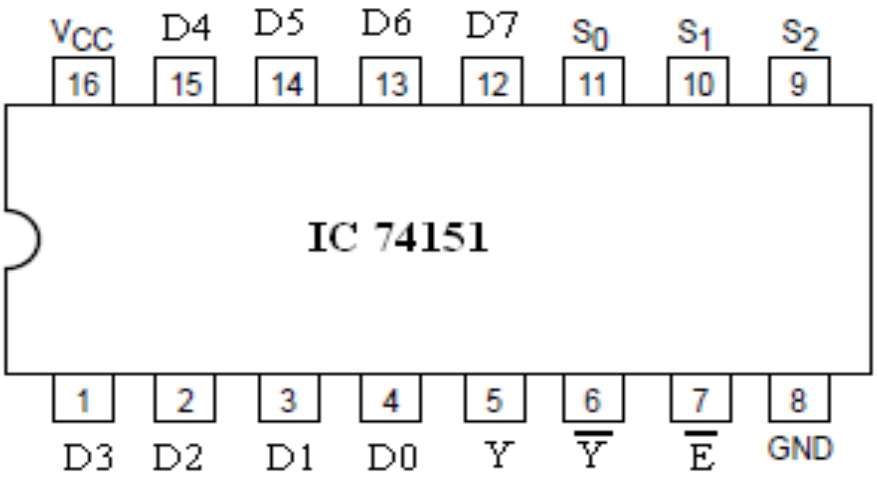
Multiplexer is a combination circuit that has maximum of 2^n data inputs and 'n' selection lines and single output line. One of these data will be connected to the output based on the values of selection lines.

Since there are 'n' selection lines, there will be 2^n possible combination of "zeros" and "ones". So, each combination will select only one data input. Multiplexer is also called MUX.

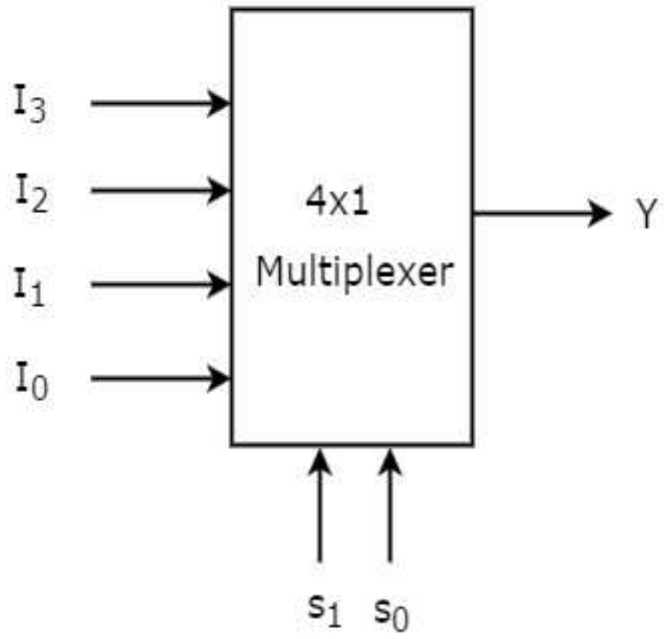
Multiplexers are classified into four types:

1. 2 : 1 Multiplexer(1 Select Line)
2. 4 : 1 Multiplexer(2 Select Line)
3. 8 : 1 Multiplexer(3 Select Line)
4. 16 : 1 Multiplexer(4 Select Line)

PIN CONFIGURATION:



BLOCK DIAGRAM:

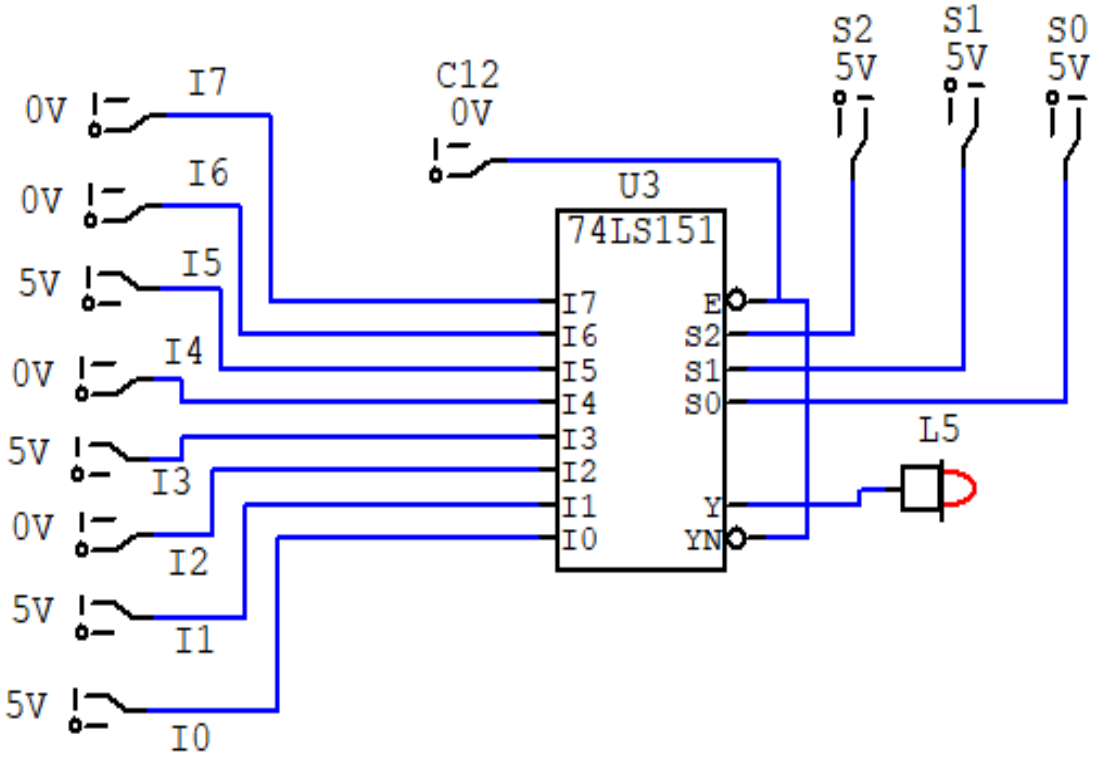


❖ TEST AND VERIFY THE 8-INPUT MUX (#IC-74151)

Function Table: 8:1 MUX, #IC-74151.

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

CIRCUIT DIAGRAM:



❖ DESIGN & IMPLEMENT 4-NIT LOGIC UNIT USING MUX (#IC-74153)

OPERATION:

S_0	S_1	Y	Operation
0	0	I_0	NOT
0	1	I_1	AND
1	0	I_2	OR
1	1	I_3	X-OR

INPUTS: A= 12, B=10

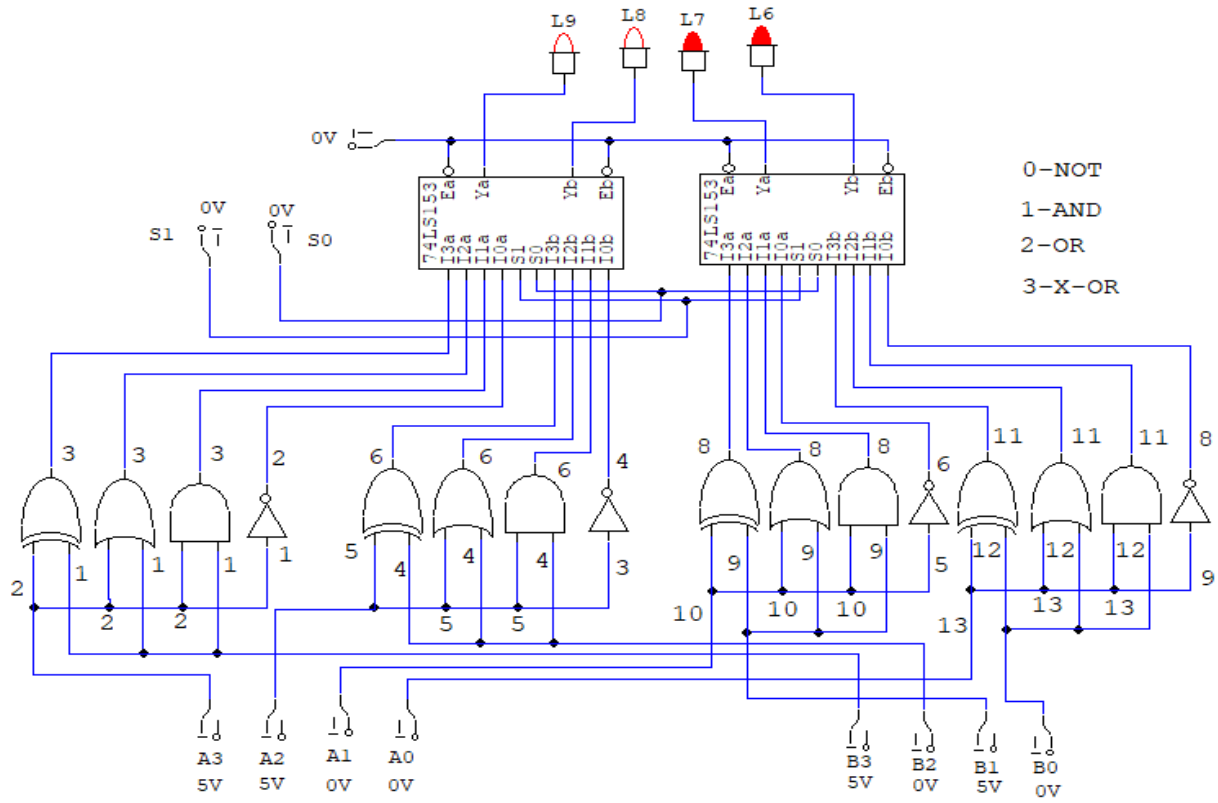
A_3	A_2	A_1	A_0	B_3	B_2	B_1	B_0
1	1	0	0	1	0	1	0

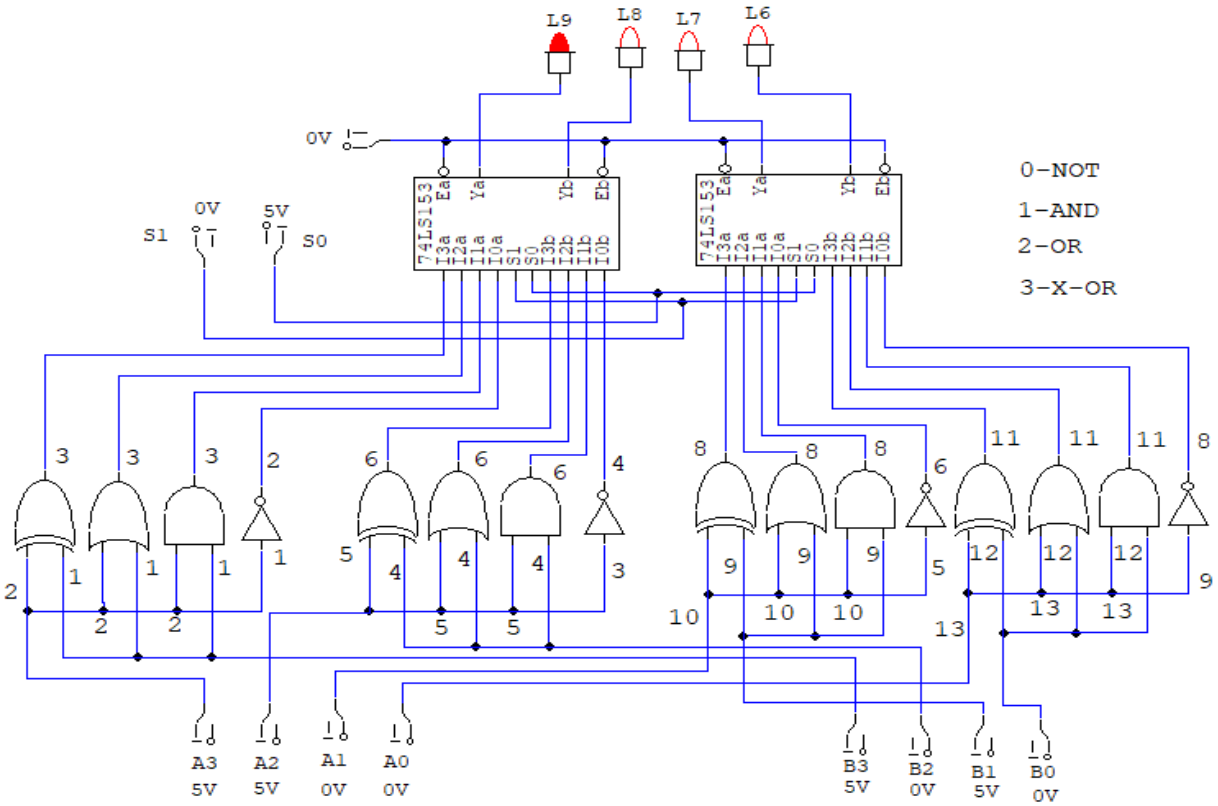
A	B	NOT(A)	AND	OR	X-OR
0	0	1	0	0	0
0	1	1	0	1	1
1	0	0	0	1	1
1	1	0	1	1	0

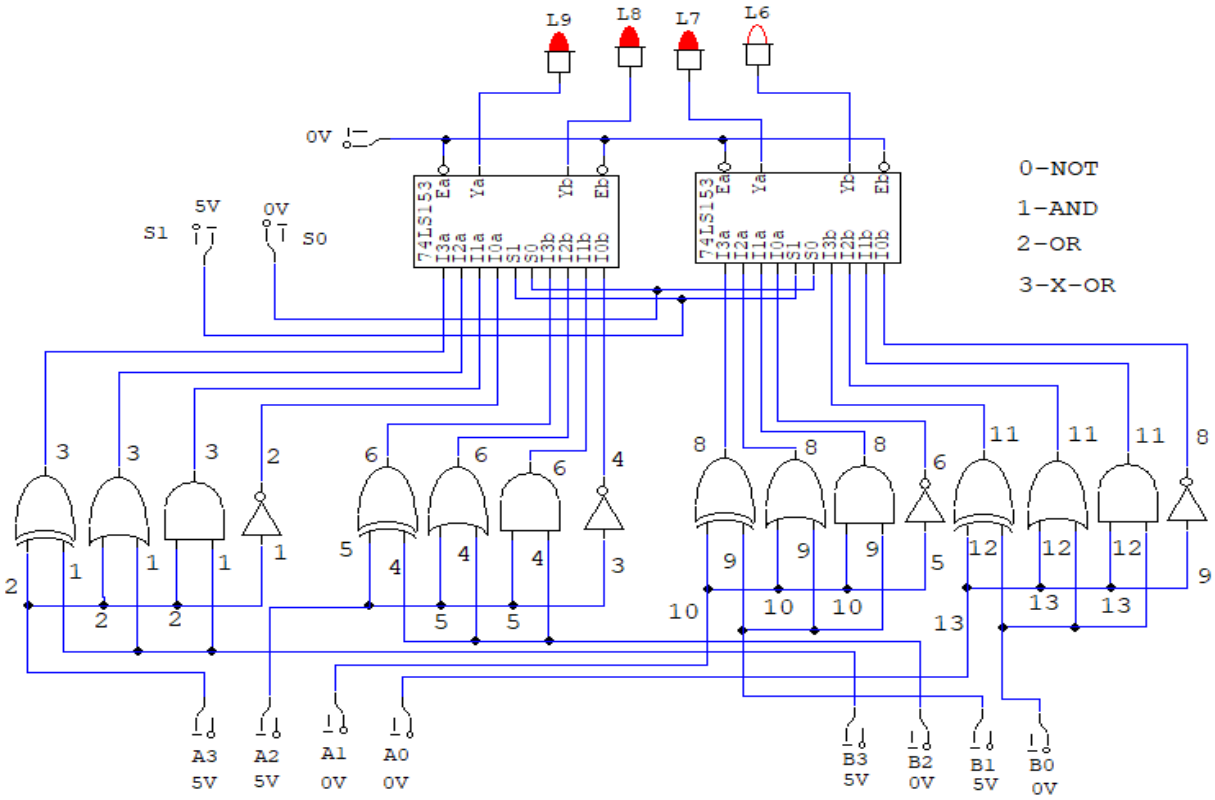
OUTPUT:

NOT	0	0	1	1
AND	1	0	0	0
OR	1	1	1	0
X_OR	0	1	1	0

CIRCUIT DIAGRAM:







DISCUSSION: In this experiment discussed about multiplexer and how to use this device. We have Test and Verified 8:1 MUX #IC 74151. We have designed #IC74153 and used NOT, AND, OR, X-OR operation and checked our circuit output.