LAB-Manual 9

Objectives:

=> To objective of this lab is to understand how to make different multiplexer and De-Multiplexer can be obtained and used by using different logic gates.

Used Equipments.

* Wires
* Bread Board
* Digital experimental board
* Logic gates.
* Electricity (Battery)

Used Software

* Multisim
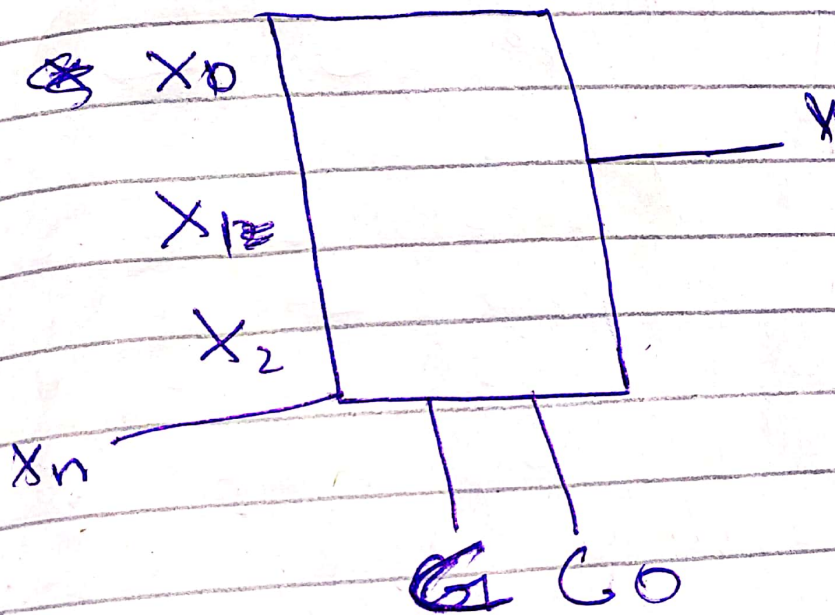* logic.ly

(Multiplexer)

=> The multiplexer is a device that has multiple inputs and single line output.

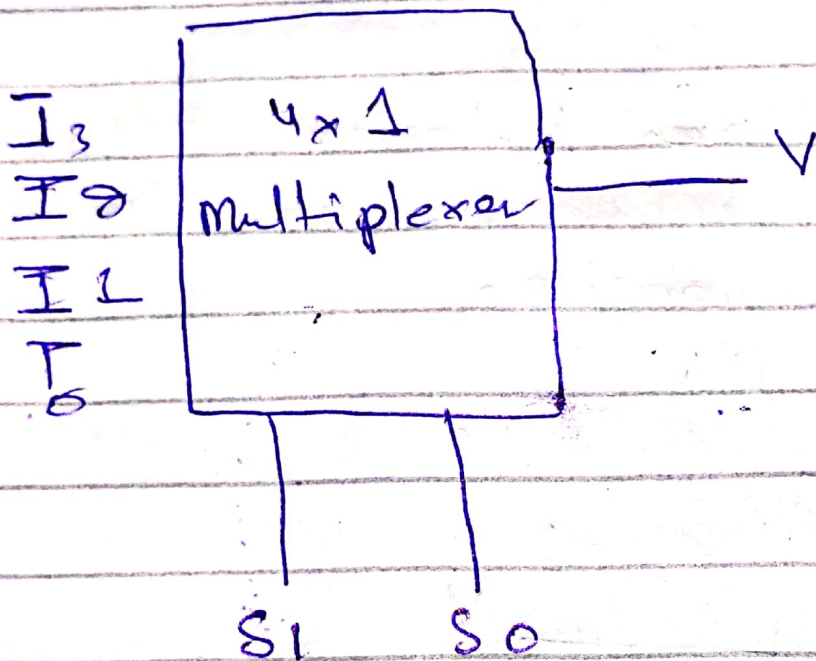=> The select lines determines which input is connected to output other words.

x_0

x_1

x_2

x_n

x

S_1 S_0

Types

4×1   Mux

8×1   Mux

16×1   Mux

4 × 1 Mux

4×1 mux has four data inputs. I_3 I_2 I_1 and I_0, Two selection lines S_1 and S_0 and one output V
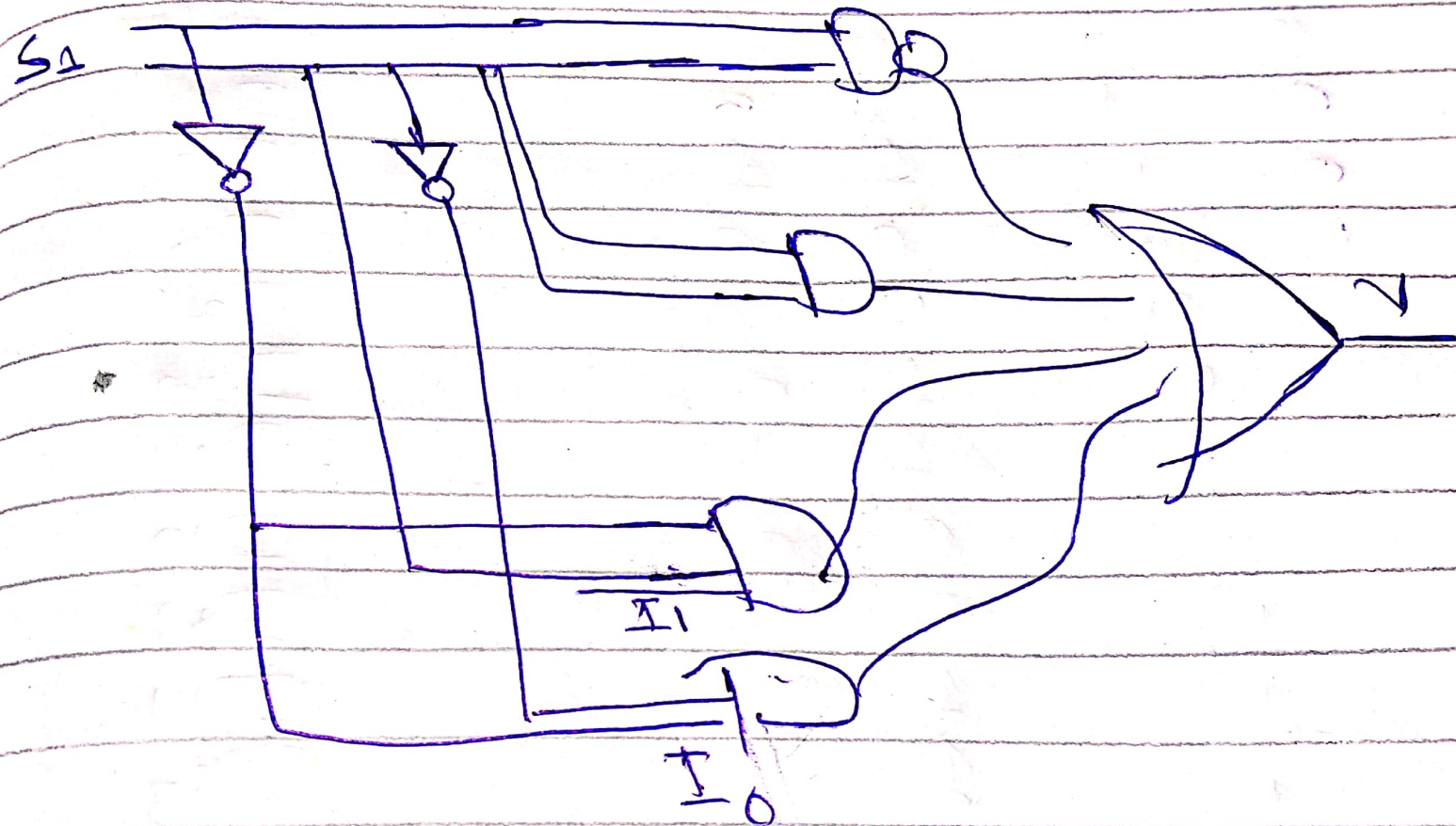
$$
\begin{array}{c}
I_3 \\
I_2 \\
I_1 \\
I_0
\end{array}
\boxed{\begin{array}{c} 4 \times 1 \\ \text{multiplexer} \end{array}} \longrightarrow V
$$

$S_1 \qquad S_0$

4×1 Mux Diagram

$$Y = S_1' S_0' I_0 + S_1' S_0 I_1 + S_1 S_0' I_2 + S_1 S_0 I_3$$

S_1

I_1

I_0

Y

Mux Truth table

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}

De — Mux

⇒ The function of De-Multiplexer is in contrast to multiplexer function. It takes information from one line and distributes it to a given number of output line.

It is also called Data Distributor. It has single input n, select lines, and maximum of 2^n outputs. The input will be connected to one of these outputs based on the selection lines values also known as De-Mux also