

Indian Institute of Information Technology Vadodara

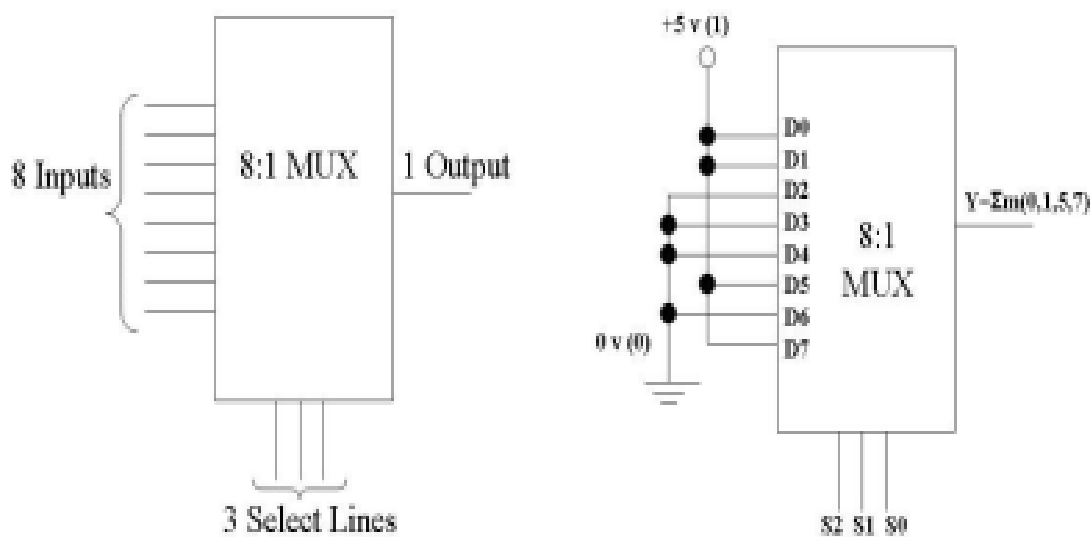
EC-261

Experiment No: 4

Aim: Verification of truth table for 8:1 multiplexer/ Demultiplexer.

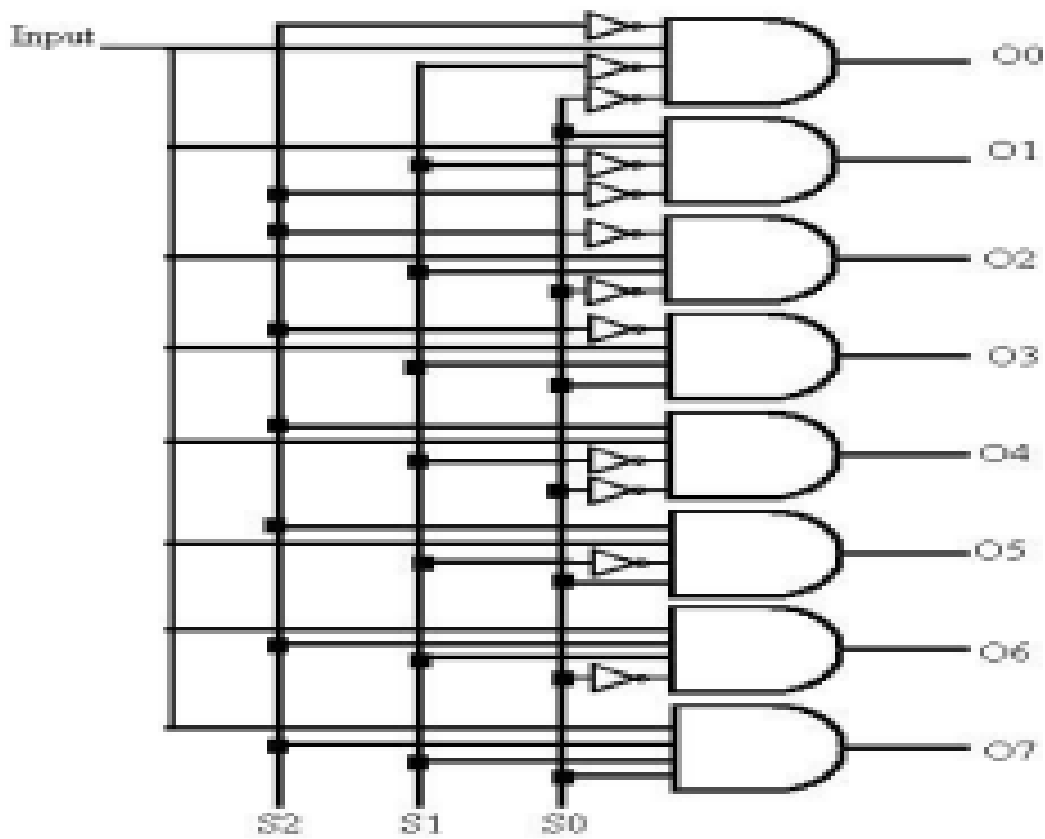
Apparatus: Logic trainer kit, 8:1 multiplexer (IC 74151), 1:8 Demultiplexer (IC 74238), wires.

Theory: A multiplexer (MUX) is an electronic circuit which has many inputs but only one output. It has some select lines, the number of select lines is related to the number of inputs. If there are N select lines, any one out of 2^N inputs can be selected. It is actually a decoder with all AND gates connected to separate select combinations and a unique input line. Their outputs are given to an OR gate to obtain one output. By using a proper combination of select lines, any one input can be selected at a time and its data is sent to the output.



Realization of a logic function by using MUX

8:1 Multiplexer circuit



1:8 Demultiplexer circuit

Selection line(S2-S0) Output(O0-O7)

S2	S1	S0	O0	O1	O2	O3	O4	O5	O6	O7
0	0	0	1	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	0	0
0	1	0	0	0	1	0	0	0	0	0
0	1	1	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	1	0	0	0
1	0	1	0	0	0	0	0	1	0	0

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

Procedure

1. Connect inputs and select lines of multiplexer to logic sources.
2. Connect output to logic indicator.
3. Set/ reset the input value in the desired manner.
4. By using select lines give any combination to multiplexer
5. Observe the output and verify that it is the same as input given to the selected input.
6. Give various input combinations, observe their corresponding outputs.
7. Switch off power supply.