EC0319 : Digital Electronics Date:_____

PRACTICAL-5

AIM: To Verify 4×1 Multiplexer using Truth Table and Logic Diagram

- To verify 4×1 multiplexer using truth table and Logic diagram :

A 4×1 multiplexer (MUX) is a combinational circuit that selects one of four input signals and forwards it to the output based on two select lines.

i). Boolean Expression :-

$$Y = \bar{S}_1 S_0 I_0 + \bar{S}_1 S_0 I_1 + S_1 \bar{S}_0 I_2 + S_1 S_0 I_3$$

where,

- S_0 and S_1 are the select lines
- I_0, I_1, I_2, I_3 are the inputs.

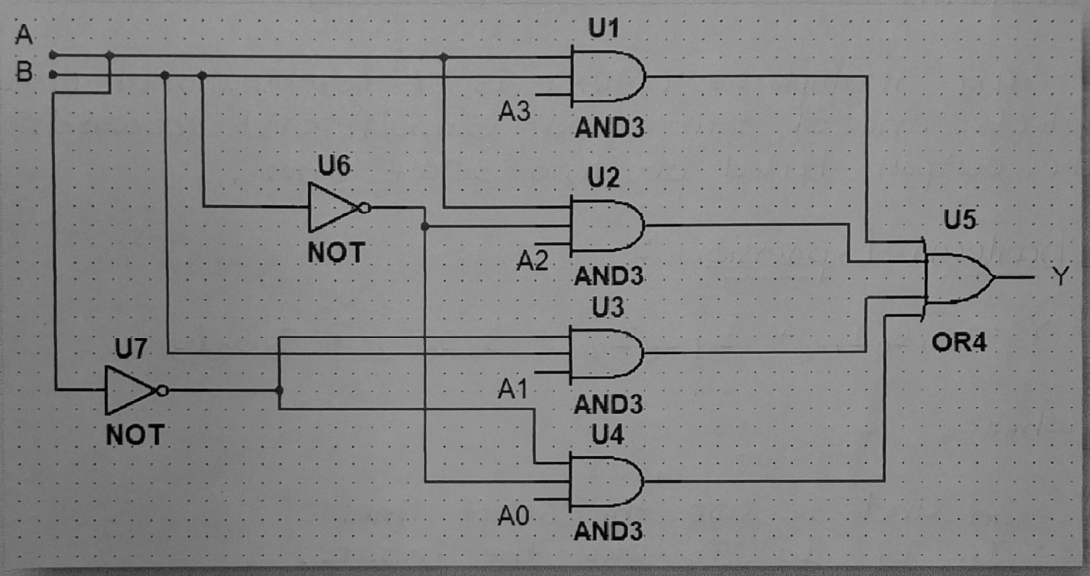
ii). Truth Table :-

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

iii). Logic Diagram :-

- The logic diagram for a 4x1 multiplexer consists of: AND and OR gate.

- Here, we will use 4 AND gates to combine each input with the corresponding select lines. and we will use a single OR gate to combine the outputs of all four AND gates.



Conclusion :-

- The 4x1 multiplexer was successfully verified using the truth table and logic diagram. The MUX selects one of four input signals based on the two select lines and forward it to the output. The experiment confirms the correct working of the multiplexer as per its truth table and logic implementation.