EXPERIMENT 7. Multiplexer

Equipment and parts required:

1 Dual 4-input Multiplexer (74153)
1 Power Supply
1 Digital Voltmeter
1 Function Generator
1 Digital Oscilloscope

1. Find data sheet and specifications

Find I/O pin numbers and specifications of all ICs from data sheet downloaded from the web (ECE labs)

Pin numbers: Vcc, ground, input and outputs of all gates.
Absolute maximum voltages: Vcc and voltages at input pins.
Normal operating voltages: V_{IL}, V_{IH}, V_{OL}, V_{OH}

2. Fill out the modified truth table

Find out how a multiplexer operates from the data sheet, and fill out the following modified truth table

S1	S0	f
0	0	
0	1	
1	0	
1	1	

3. Design a combinational logic circuit

A multiplexer can be used for designing a combinational logic circuit. Design a logic circuit defined by the following truth table using a 4-input multiplexer, and draw a logic diagram.

X	Y	f
0	0	1
0	1	0
1	0	0
1	1	1

4. Implement your design

Implement your design on the breadboard. Do not connect the power supply before checking the correctness of your wiring.

5. Connect power supply

Adjust the power supply at 5 Volts and set the current limit to maximum. Then connect the power supply to Vcc and Gnd bus.

6. Measure the output voltage

Connect the output of the circuit to a digital voltmeter, and measure the output voltage for different input voltages. Before the measurement, connect Gnd and Vcc pins to the power buses of the breadboard. İs your implementation working as you expected?

Input 1	Input 2	Output
0 Volts	0 Volts	
0 Volts	5 Volts	
5 Volts	0 Volts	
5 Volts	5 Volts	