**Discussion:**

In **Experiment-1**, we place the 7408 AND IC on the breadboard. We are making sure that every pin of the IC is on separate node on the breadboard. Then we connect the VCC and GND pins of the IC to the +5V and GND ports of the trainer board respectively. From the figure of the ICs, we label the pin numbers of the input and outputs of the gate using pin configurations. Then we connected each input of the gate to a toggle switch at the bottom of the trainer board. Then we connect the output of the logic gate to an LED at the right side of the trainer board. Toggling the switches on and off, we take every possible combination of the gate and see if the LED is turned on or off simultaneously. The record the results in Table F.1.1.6. As done with AND IC, we replace it with OR, NAND and XOR ICs without changing the connections (As their pin configurations are same). However, we change the connection of the NOT and NOR ICs as their combinations are a bit different.

While doing the experiment, we did not face any major problems/issues.

In **Experiment-2**, we complete the truth table for the 3-input AND gate in Table F.2.1.2. Using the associative law given in the Table B3, we express the 3-input function using 2-input AND gates in table F.2.2.3. As before, we identify the pin numbers of the ICs and connect them in order to make a complete circuit. Then we connect the output to LED and see the results. Repeat the steps for 3-input OR gates.

Firstly, we connect the pins 1 and 2 with two switches (1A and 1B). Then we connect the output of pin-3 (1Y) to the input of another logic gate in pin-4 (2A). We connect pin-5 (2B) with another switch as an input and connect the output from pin-6 (2Y) to LED. Thus we get 3 input AND gate from 2 input AND gates.

Then we change the AND IC with the OR IC keeping the connections same (as the pin configuration of AND and OR ICs are same) and get 3 input OR gate from 2 input OR gate.

This experiment was also flawless and smooth.

In **Experiment-3,** We start by completing the truth table for the implicants, A', B, and C in Table F.3.1. Using the values of the implicants, we complete the truth table for the function in Table F.3.1. We label the pin numbers for the NOT, AND and OR gates of the function in Figure F.3.1, using the pin configurations in Figure B.2. We connect the input to a NOT gate using the pins assigned in step 3 and check the output via an LED. We wire up implicant A'. We connect the output of A' to an LED and verify it using the truth table. We connect the input to a NOT gate using the pins assigned in step 3 and check the output via an LED. We wire up implicant B. We connect the output of B to an LED and verify it using the truth table. We wire up implicant C. We connect the output of C to an LED and verify it using the truth table. We connect the outputs of the three implicants as inputs to the OR gates (using the associative law). We connect the output to an LED and verify the function using the truth table.

In this experiment, we successfully implemented a Boolean equation using logic gates, and verified the function using a truth table and LEDs. We used NOT, AND and OR gates to connect the implicants according to the Boolean equation, and then verified the function by connecting the outputs to LEDs and checking them against the truth table. This experiment helped us to understand the practical implementation of Boolean functions using logic gates, and how to verify the correctness of the implementation using truth tables and LEDs.