CSE260 Lab Report-1

Experiment: Familiarization of Fundamental Logic Gates

Group-1:

21301351_Md Tasrif Khan,
21301350_Fardeen Mohammad Monayem,
22101428_Sibgatullah Tasnim,
22101710_Md. Anwar Hossain

1) Name of the Experiment: Familiarization of Fundamental Logic Gates.

2) Objective:

- ☐ To get familiarized with fundamental logic gates and demonstrate the input-output relationship of 2-input AND(IC-7408), OR(IC-7432) and NOT(IC-7404) gates by constructing their truth tables.
- ☐ To get familiarized with other logic gates like NAND(IC-7400), NOR(IC-7402), XOR(IC-7486) and XNOR(IC-74266)

3) Required Components and Equipments: Trainer board, Bread Board, IC-7486, IC-7400 and IC-7402.

4) Experimental Setup: To start with, for the experimental setup bread board and the trainer board were used. IC-7486, IC-7400 and IC-7402 which represent XOR, NAND and NOR gates were used for the experiment. Besides, some wires were also used for the input and output of the gates. It was also checked whether the wires were working properly. Next, the pin 7 and pin 14 were connected to the "GND" position and "+5V" position using the wires.

Consequently, for the IC-7486 which is XOR gate two inputs were taken using the wires. The two inputs were taken from pin 1 and pin 2 respectively. Then, output is taken using pin 3. After that outputs were matched with the truth table of XOR gate. Similarly, pin 1 and pin 2 were taken as input and pin 3 was taken as the output respectively for IC-7400 which is NAND gate and matched with the truth table of NAND gate. But an exception occurs in case of IC-7402 which is NOR gate. In this case, inputs were taken with pin 2 and 3 and the output pin was 1. Then again, outputs were matched with the truth table of NOR gate. The output values of the three ICs matched with the truth table of the following gates. As for the wires, one part of the wire was connected to a pin of the IC and the other part to the input and output respectively. By using different inputs, test was taken whether the output bulb lights up or not. Thus, in this way the equipments were set up for the experiment.

5) Results (Truth Table) and Discussions:

Table-1

Input		output
A	B	
0	0	0
1	0	1
0	1	1
1	1	0

Figure-1: IC-7486 (XOR gate)

Table-2

Input		Output
A	B	
0	0	1
1	0	1
0	1	1
1	1	0

Figure-2: IC-7400 (NAND gate)

Table-3

Input		output
A	B	
0	0	1
1	0	0
0	1	0
1	1	0

Figure-3: IC-7402 (NOR gate)

In case of Table-1 of XOR gate it is seen that if the inputs are same then the output will be 0. Otherwise, the output is 1. Consequently, in Table-2 for NAND gate if both the inputs were taken as 1 then the output was 0. But in the other cases, the output was 1. Moreover, in case of Table-3, the opposite phenomenon of NAND gate is seen. The IC used here is of NOR gate and it is seen that if both inputs are taken as 0 then the output will be 1. For all the other inputs, the output will be 0.