CSE 332/ EEE 336/ ETE 336 Computer Organization and Architecture



Lab Manual

Department of Electrical and Computer Engineering School of Engineering and Physical Sciences North South University, Bashundhara, Dhaka-1229, Bangladesh

Experiment No: 1

Experiment Name: Design of a 2-bit Logic unit.

Introduction:

In this experiment you will construct a 2-bit logic unit which is actually a part of an ALU. This logic unit will have 4 micro-operations which are AND, OR, XOR and NOT operations. Logic micro operations are very useful for manipulating individual bits or a portion of a word stored in a register. They can be used to change bit values, delete a group of bits or insert a new set of bits in a register. As we are going to design a 2-bit logic unit, we will have two outputs which is one output for each of the 2 bits.

Equipments:

Trainer board IC 7404,7408,7432,7486, 74F153 Wires for connection.

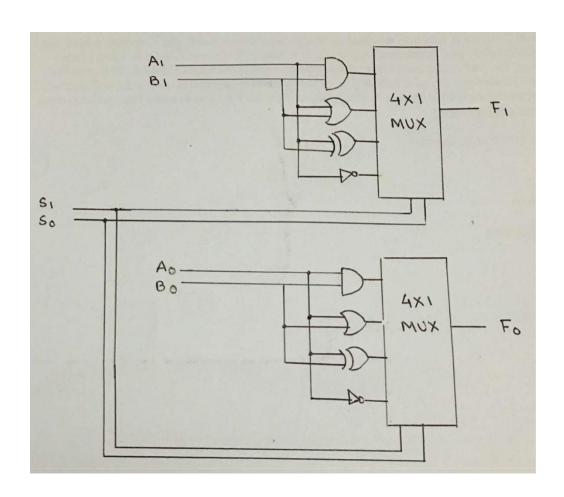
Truth Table:

Complete the Truth Table according to your theoretical knowledge.

A 1	Α0	B1	В0	AND1	AND0	OR1	OR0	XOR1	XOR0	NOT A1	NOT A0
0	0	0	0								
0	0	0	1								
0	0	1	0								
0	0	1	1								
0	1	0	0								
0	1	0	1								
0	1	1	0								
0	1	1	1								
1	0	0	0								

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

Logic Diagram:



Procedure: (hardware)

- 1) Place the ICs on the trainer board.
- 2) Connect Vcc and ground to the respective pins of IC.
- 3) Connect the inputs with the switches and the outputs with LEDs.
- 4) Apply various combinations of inputs and observe the outputs.
- 5) Verify the experimental outputs with the Truth Table.

Assignment/Task:

- 1. Implement the circuit in Logisim. Submit .circ file in Google Classroom within the given time by your lab instructor. You have to include the <u>screenshot</u>** of the circuit in your lab report.
- 2. Prepare and submit the lab report by 11:59 pm today in Google Classroom individually. Plagiarism and late submission will not be tolerated.

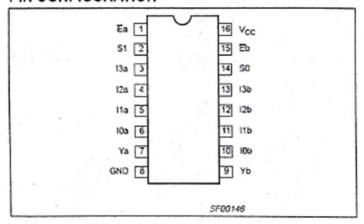
** Screenshot Procedure:

The screenshot should contain your name and ID along with the circuit.

Pin configuration of ICs:

EEE336/CSE232 LAB Dual 4x1 Multiplexer 74F153 Data Sheet

PIN CONFIGURATION



INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION					
10a – 13a	Port A data inputs					
10b – 13b	Port B data inputs					
S0, S1	Common Select inputs					
Ea	Port A Enable input (active Low)					
Eb	Port B Enable input (active Low)					
Ya, Yb	Port A, B data outputs					

Section 11.1 Introduction to Experiments

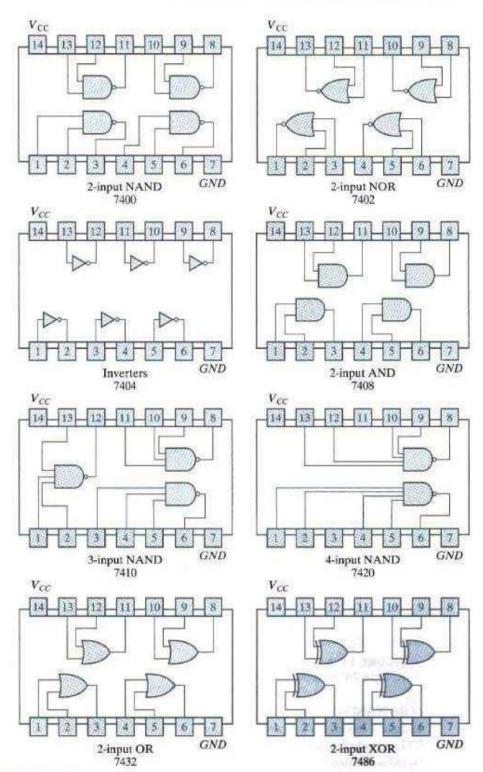


FIGURE 11.1
Digital gates in IC packages with identification numbers and pin assignments