Department of Software Engineering

Lab 2

Course:	**CALD**	Instructor:	**Engr. Sidra Rafique**
Topic:	**Verification of Basic Logic Gates & their Truth tables**		**Deadline:** 22-4-2025

Objective: To study and understand the basic functioning and truth tables of various logic gates including AND, OR, NOT, NAND, NOR, and XOR.

APPARATUS: Power Supply, Breadboard, Connecting wires.(virtually)

THEORY: Logic gates are the digital circuits with one output and one or more inputs. They are the basic building blocks of any logic circuit. Different logic gates are: AND, OR, NOT, NAND, NOR, XOR. They work according to certain logic.

1. **AND:** Logic equation. Y = A.B

The output of AND gate is logic 1 when both the inputs A and B are at high logic.

2. **OR:** Logic eqn. Y = A+B.

The output of OR gate is logic 1 when either one of the inputs A or B or both the inputs are logic 1.

3. **NOT:** Logic eqn. Y = $\bar{A}$.

The output of NOT gate is complement of the input.

4. **NAND:** Logic eqn. Y = ~(A.B) or Y= (A.B)'

The output of NAND gate is high logic or logic 1 when one of the inputs or both the inputs are low level.

5. **NOR:** Logical eqn. Y = A+B.

The output of NOR gate is true when both the inputs are low.

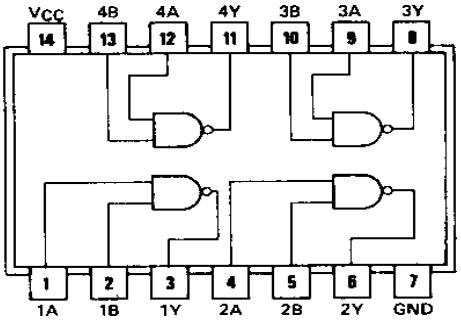
6. **X-OR:** Logic eqn. Y=AB+AB.

The output of XOR gate is true when both inputs are complemented of each other.

IC PINOUTS

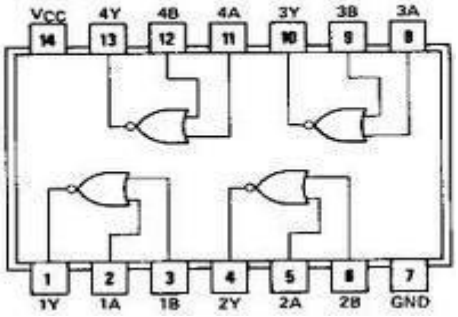
TRUTH-TABLE

7400



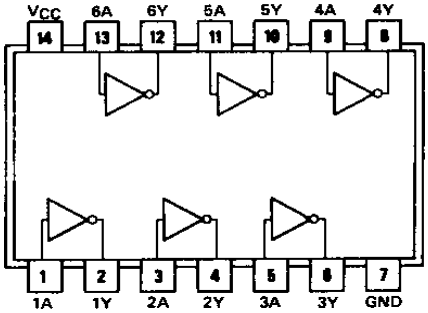
NAND-7400		
A	**B**	**Y**
0	0	
0	1	
1	0	
1	1	

7402



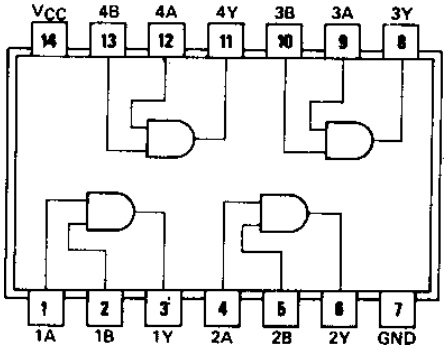
NOR-7402		
A	**B**	**Y**
0	0	
0	1	
1	0	
1	1	

7404

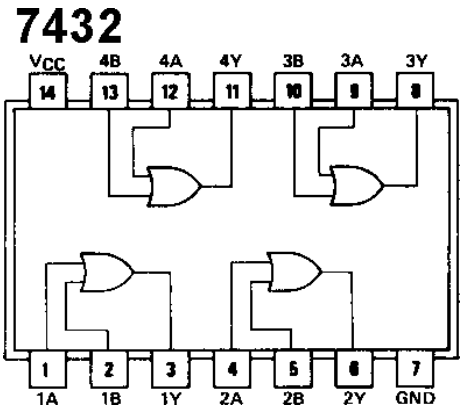


NOT- 7404	
A	**Y**
0	
1	

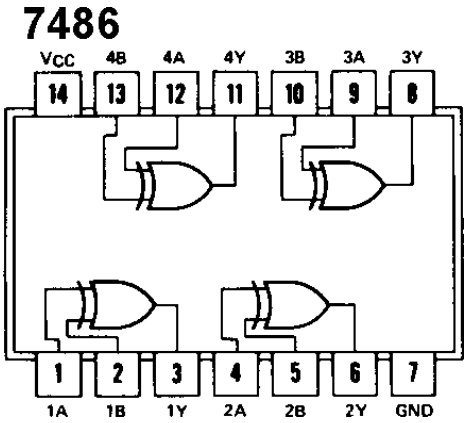
7408



AND- 7408		
A	**B**	**Y**
0	0	
0	1	
1	0	
1	1	



OR- 7432		
A	**B**	**Y**
0	0	
0	1	
1	0	
1	1	



XOR- 7486		
A	**B**	**Y**
0	0	
0	1	
1	0	
1	1	

Procedure:

Write procedure to make connections using EWB in your Own words.