TO STUDY EXCLUSIVE-OR & EXCLUSIVE-NOR GATE

OBJECTIVE:

- To investigate the behavior of the EX-OR
- To investigate the behavior of the EX-NOR

THEORY:

In Experiment 1&2, you learned the characteristics fundamental logic gate. You will now be introduced to two of the remaining logic gates, the EX-OR and EX-NOR. An exclusive OR (XOR) gate is gate with two or more three inputs and one output an output of two inputs XOR assumes a high state if one and only one input assume a high state. This is equivalent to saying that the output is a High if either input X or Y is high exclusively, and low when both are 1 and 0 simultaneously.

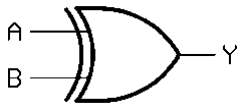
The **Exclusive-NOR Gate** function or Ex-NOR for short, is a digital logic gate that is the reverse or complementary form of the Exclusive-OR function. the output of an Exclusive-NOR gate **ONLY** goes "HIGH" when its two input terminals, A and B are at the "**SAME**" logic level which can be either at a logic level "1" or at a logic level "0".

EQUIPMENT / REQUIREMENT:

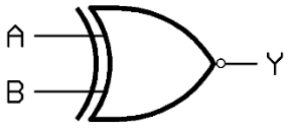
- 7486 IC XOR
- 74266 IC XNOR
- 2 LED or Logic probe
- 0-5 volt DC power supply

PROCEDURE:

Figure 2-1 shows logic symbols of XOR & XNOR *Figure 2-2* shows the layouts of XOR gate IC (7486) & XNOR gate IC (74266).The pin configuration is also given in the layouts. Construct the circuit with the help of these layouts. Pin no. 7 and Pin no. 14 of each IC is Ground and VCC respectively, Apply different inputs on the given input pins and observe the out puts, and then complete the truth *tables 3-1* and *3-2* of these gates.

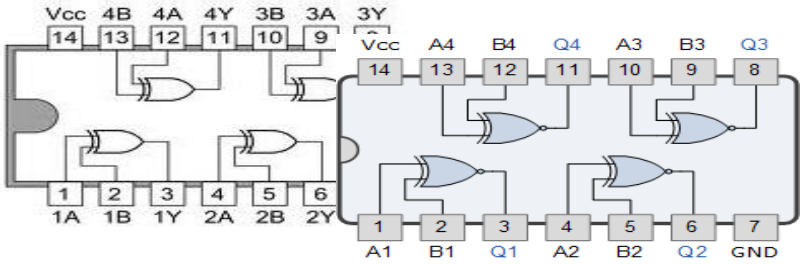


(a) XOR gate Symbol



(b) XNOR gate Symbol

Fig3-1



(a) IC configuration 7486 *(b) IC Configuration 74266*

Fig3-2

OBSERVATION TABLE:

A	B	$X = A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

3-1 Truth Table for XOR gate

A	B	$X = \overline{A \oplus B}$
0	0	1

0	**1**	**0**
1	**0**	**0**
1	**1**	**1**

3-2 Truth Table for XNOR gate

QUESTIONS / RESULTS

1. If the 0 and 1 were inputs for a XOR gate, what would be the output
   ANSWER: THE OUTPUT WOULD BE HIGH.
2. If a signal passing through a gate is inhibited by sending a LOW into one of the inputs, and the output is LOW, the gate is an **XNOR**.
3. XNOR provides the inverted output of an XOR. **TRUE**.

CONCLUSION:

XOR:XOR GATE GIVES HIGH OUTPUT WHEN BOTH THE INPUT ARE NOT IDENTICAL (BOTH 0'S AND 1'S)

XNOR:XNOR GATE GIVES HIGH OUTPUT WHEN BOTH THE INPUTS ARE IDENTICAL (BOTH 0'S AND 1'S)