Lab #5

Name: _____ Per: _____

Title: XOR AND XNOR GATES

Materials:
[1] 7404 inverter IC
[1] 7486 2-input exclusive OR gate IC

Procedure:

1. Insert a 7486 in the breadboard.
2. Wire the 2-input XOR gate shown in Fig. 3-12.
3. Move the input switches as shown in Table 3-12. Observe and record the output results in the XOR column in Table 3-12.
4. Construct the 2-input XNOR gate diagrammed in Fig. 3-13 and complete Table 3-12. **Get Instructor's Signature.**
5. Move the inputs switches as shown in Table 3-12. Observe and record the output results in the XNOR column in Table 3-12.
6. Construct the 3-input XOR gate diagrammed in Fig. 3-14.
7. Move the input switches as shown in Table 3-13. Observe and record the output results in the XOR column in Table 3-13.
8. Construct the 3-input XNOR gate diagrammed in Fig. 3-15.
9. Move the input switches as shown in Table 3-13. Observe and record the output results in the XNOR column in Table 3-13. **Get Instructor's Signature.**

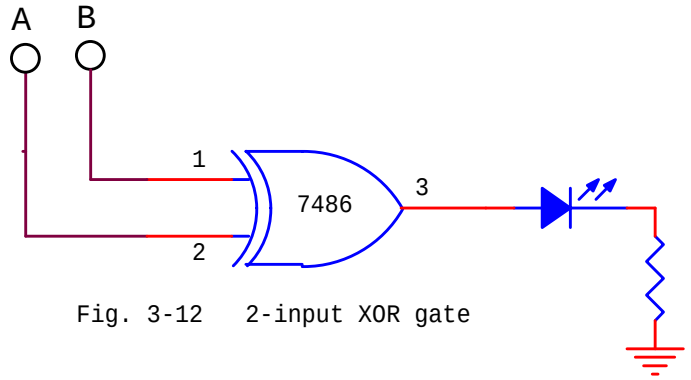

Fig. 3-12 2-input XOR gate

Questions (answer on a separate piece of paper – **"Draw" means you must use a template**):

1. Write the Boolean expression for each of the following circuits you constructed in this experiment:
   a. 2-input XOR gate
   b. 2-input XNOR gate
   c. 3-input XOR gate
   d. 3-input XNOR gate
2. **Draw** a logic symbol diagram of a 2-input XOR gate using four 2-input NAND gates.
3. The XOR gate's output is a _____ (0,1) when an odd number of inputs are High.
4. The XNOR gate's output is a _____ (0,1) when an even number of inputs are High.

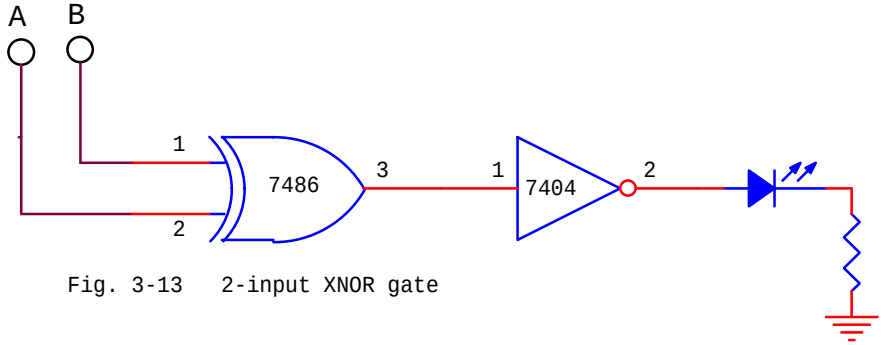

Fig. 3-13 2-input XNOR gate

Inputs		Outputs	
A	B	XOR	XNOR
0	0		
0	1		
1	0		
1	1		

Table 3-12 Truth Table for XOR and XNOR

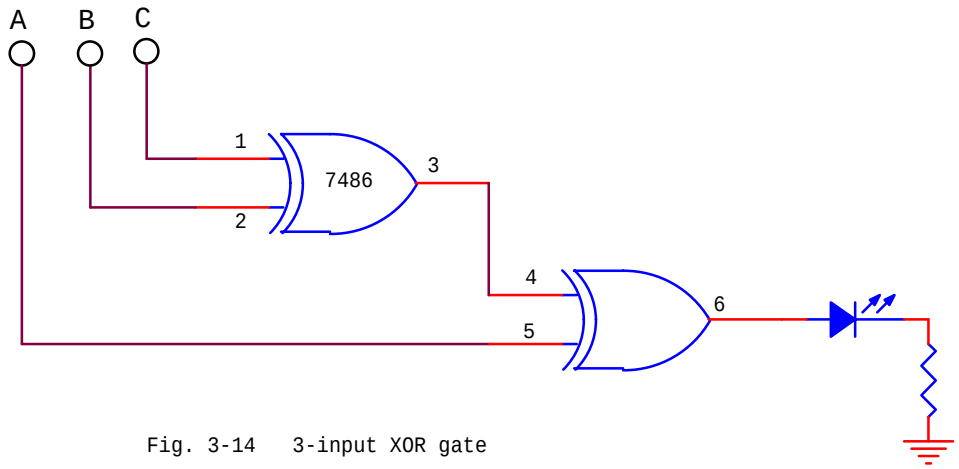

Fig. 3-14 3-input XOR gate

Inputs			Outputs	
A	B	C	XOR	XNOR
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Table 3-13

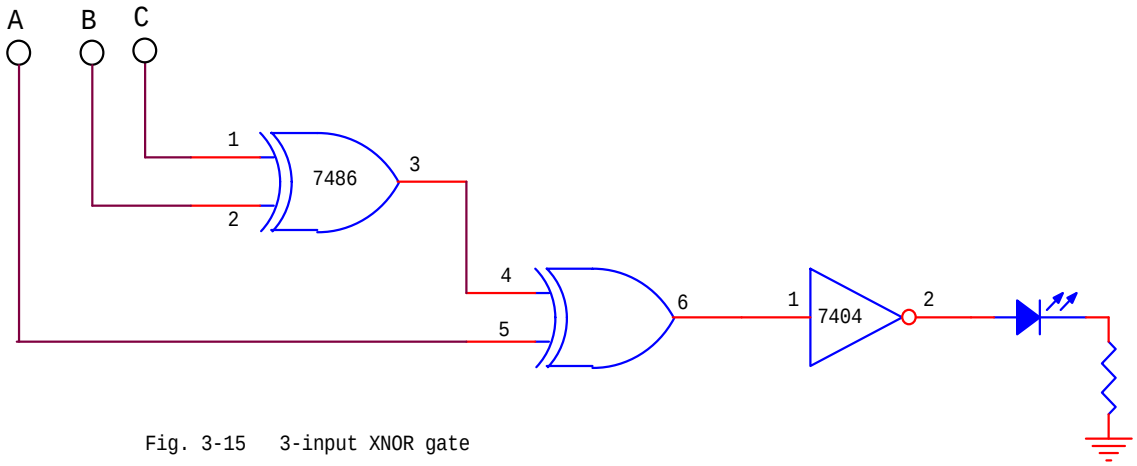

Fig. 3-15 3-input XNOR gate