

Circle the correct answer:

The LED in Figure 2.8 lights when the output of the inverter is HIGH/LOW.

Close the logic switch connected to pin 1. Is the LED ON or OFF? (Circle one.)
Measure the logic levels at pins 1 and 2 of the inverter with a logic probe or a voltmeter.

Pin Number	Logic Level
1	
2	

One of the LEDs in Figures 2.7 and 2.8 is active-LOW and one is active-HIGH. State which is which.

Figure 2.7	active- _____
Figure 2.8	active- _____

Instructor's Initials _____

DIP Integrated Circuits

Name _____ Class _____ Date _____

- Objectives** Upon completion of this laboratory exercise, you should be able to:
- Describe the configuration of several basic logic gates in dual in-line packages.
 - Wire a logic gate integrated circuit (IC) on a prototyping breadboard.
 - Obtain the truth tables of each gate to be tested.

Reference Ken Reid and Robert Dueck, *Introduction to Digital Electronics*
Chapter 2: Logic Functions and Gates

Equipment Required +5-volt power supply or digital trainer
Breadboard
Wire strippers
#22 solid-core wire, as required
Components as follows:

Part No.	Qty.	Description
74LS00 or 74HC00	1	Quad 2-input NAND gate
74LS02 or 74HC02	1	Quad 2-input NOR gate
74LS04 or 74HC04	1	Hex Inverter
74LS08 or 74HC08	1	Quad 2-input AND gate
74LS32 or 74HC32	1	Quad 2-input OR gate
74LS86 or 74HC86	1	Quad 2-input XOR gate
	1	If not using a digital trainer: 4PST or 8PST DIP switch
	1	LED
	1	Resistor, 330 Ω , $\frac{1}{4}$ W
	2	Resistor, 10 k Ω , $\frac{1}{4}$ W

Experimental Notes

A common way to package logic gates is in a plastic or ceramic **dual in-line package**, or **DIP**, which has two parallel rows of pins. The standard spacing between pins in one row is 0.1" (or 100 mil). For packages having less than 28 pins, the spacing between rows is 0.3" (or 300 mil). For some larger packages, the rows are spaced by 0.6" (or 600 mil).

The outline of a 14-pin DIP is shown in Figure 3.1. There is a notch on one end to show the orientation of the pins. When the IC is oriented as shown, pin 1 is at the bottom left corner and the pins number counterclockwise from that point.