

AIM: To set up and test a 7-segment static display system to display numbers 0 to 9.

LEARNING OBJECTIVE:

To learn about various applications of

7-segment decoder

To learn and understand the working of IC 7447

To learn about types of seven-segment display

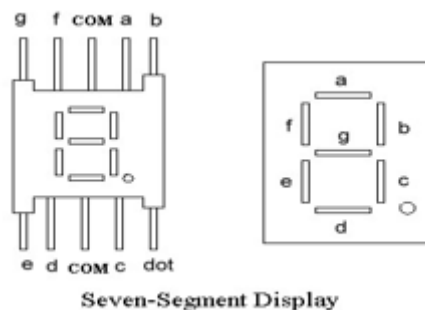
COMPONENTS REQUIRED:

IC7447, 7-Segment display (common anode), Patch chords, resistor (1K Ω) & IC Trainer Kit

THEORY:

The Light Emitting Diode (LED) finds its place in many applications in these modern electronic fields. One of them is the Seven Segment Display. Seven-segment displays contain the arrangement of the LEDs in "Eight" (8) positions, and a Dot (.) with a common electrode, lead (Anode or Cathode). The purpose of arranging it in that position is that we can make any number out of that by switching ON and OFF the particular LED's. Here is the block diagram of the Seven Segment LED arrangement.

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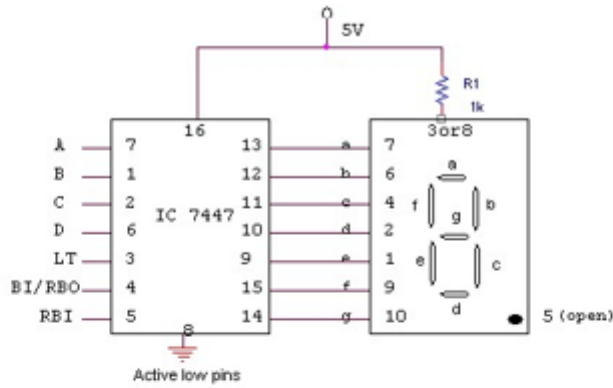
Seven Segment Display

LED's are basically of two types-

Common Cathode (CC) -All the 8 anode legs use only one cathode, which is common. Common Anode (CA)-The common leg for all the cathode is of Anode type.

A decoder is a combinational circuit that connects the binary information from 'n' input lines to a maximum of 2^n unique output lines. The IC7447 is a BCD to 7-segment pattern converter. The IC7447 takes the Binary Coded Decimal (BCD) as the input and outputs the relevant 7 segment code.

Circuit Diagram:

TRUTH TABLE:

BCD Inputs				Output Logic Levels from IC 7447 to 7-segments							Decimal number display
D	C	B	A	a	b	c	d	e	f	g	
0	0	0	0	0	0	0	0	0	0	1	0
0	0	0	1	1	0	0	1	1	1	1	1
0	0	1	0	0	0	1	0	0	1	0	2
0	0	1	1	0	0	0	0	1	1	0	3
0	1	0	0	1	0	0	1	1	0	0	4
0	1	0	1	0	1	0	0	1	0	0	5
0	1	1	0	1	1	0	0	0	0	0	6
0	1	1	1	0	0	0	1	1	1	1	7
1	0	0	0	0	0	0	0	0	0	0	8
1	0	0	1	0	0	0	1	1	0	0	9

PROCEDURE:

- Check all the components for their working.
- Insert the appropriate IC into the IC base.
- Make connections as shown in the circuit diagram.
- Verify the Truth Table and observe the outputs.

VIVA QUESTIONS:

1. What are the different types of LEDs?
2. Draw the internal circuit diagram of an LED.
3. What are the applications of LEDs?

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