



MARKS	
DEMO:	/10
REPORT:	/35
TOTAL:	/45

**ENT 262
DIGITAL LOGIC DESIGN
SEMESTER 1 2019/2020**

LABORATORY 5

**APPLICATION :
DECODER & SEVEN SEGMENT**

Student's Particular

Name :
Matrix No :
Group :
Date of exp :
Breadboard No :

LAB 5 : DECODER & SEVEN SEGMENT

OBJECTIVES

1. To expose the student with one of the combinational logic circuits application.
2. To design and construct a decoder.
3. To understand the operation of decoder.

EQUIPMENTS/COMPONENTS

- Logic gates (74XX-series)
- Seven Segment
- 330 ohm (Qty : 7 units)

INTRODUCTION

A decoder is a circuit that creates an output based on the binary states of a given input. It is used in many applications. One example is in computers for input/output selection. Computers must communicate with a variety of external devices (e.g. printers, disk drives, modem etc.) by sending and/or receiving data through what is known as input/output ports. In this case, a decoder is used to select the I/O port as determined by the computer so that data can be sent or received from a specific external device. Other than that, systems such as digital watches, calculators and cellular phones use decoders for multi-segment display. In this case, decoders are needed in these systems to decode the binary data into the multi-segment data to drive the display.

In this experiment, you are required to design a decoder based on an existing decoder IC. Thus, you are strongly advised to read and understand how to design a decoder as your pre-lab assignment. You should be able to generate the function table and draw the schematic diagram. As in previous experiments, you are required to construct and test the circuit.

DESIGN PROBLEM

In this lab you are going to proceed an experiment with a decoder and associated hardware to derive a seven-segment LED display. You are required to design and test a circuit in order to convert a 4-bit BCD signal to a 7-bit control signal according to the following figure:

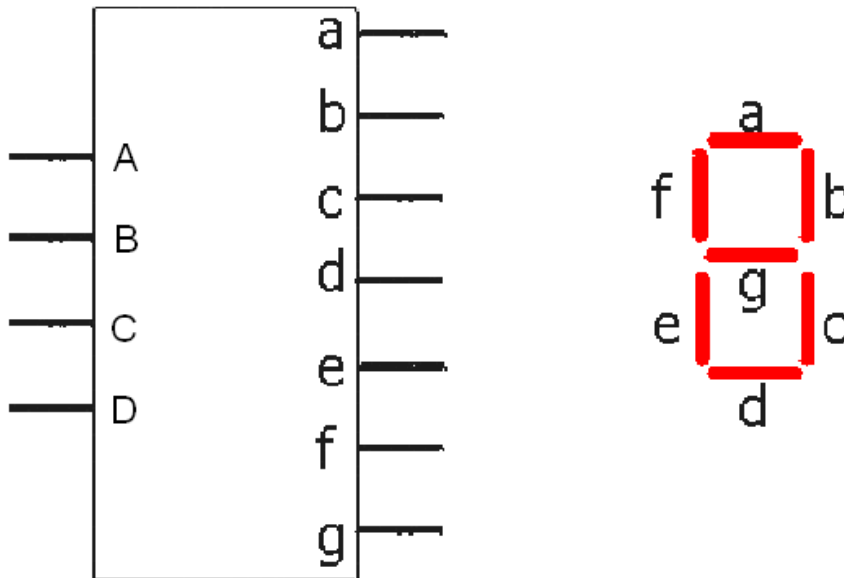


Figure 4.1

1. In this experiment, you have to create your own combinational logic decoder to display the following number.



2. Generate a truth table to display the above number ONLY.
3. Prepare necessary steps using the K-map technique and obtain the Boolean expression.
4. From the Boolean expression, draw the schematic of BCD to seven segment decoder by combining all the basic gates.
5. Construct your design onto the breadboard and demonstrate to Lab's instructor.

Note: Seven segment is common cathode type (active high).

Boolean expression [5 marks]

Circuit Diagram [10 marks]

Char.	A	B	C	D	BCD 7 Segment Display
y					
2					
0					
1					
9					

MARKS	
DEMO:	/10

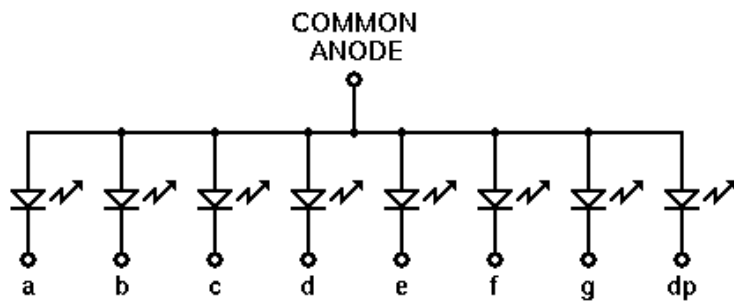
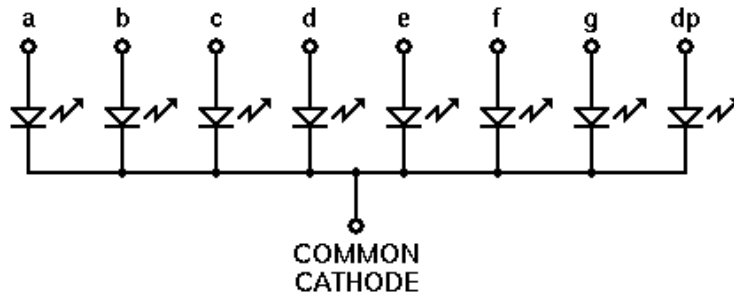
DISCUSSION

[3 marks]

CONCLUSION

[2 marks]

APPENDICES



7-segment display

