

Experiment no: 8

Name: Code converter

Aim: Design a circuit that converts Gray code to Binary.

Objectives: To study the design implementation and the working of code conversion.

Components: Bread board / kit, 7408, 7485, 7404, 7432, 7430, 7447.

Theory: Gray Code to Binary:

- a) most significant bit (B_1) is same as the most significant bit in gray code ($B_1 = G_1$)
- b) To find next bit perform EX-OR (Exclusive) between the current binary bit & previous bit.
$$G_n = B_n (EX-OR) B_{n-1}$$

Procedure:

1. connections are made as per the circuit diagram
2. Switch the power supply.
3. Apply different combinations of inputs observe the output, compare the output with the truth table

Result:

Different logic circuits are constructed and their truth tables are verified.

3 Bit gray code to binary converter

THREE BITES					
Gray (Input)			Binary (Output)		
A	B	C	X	Y	Z
0	0	0	0	0	0
0	0	1	0	0	1
0	1	1	0	1	0
0	1	0	0	1	1
1	1	0	1	0	0
1	1	1	1	0	1
1	0	1	1	1	0
1	0	0	1	1	1

K-map for X

	BC 00	01	11	10
A 0	0	0	0	0
1	1	1	1	1

$$X = A$$

K-map for Y

	BC 00	01	11	10
A 0			1	1
1	1	1		

$$Y = AB' + A'B$$

K-map for Z

A \ BC	00	01	11	10
0		1		1
1	1		1	

$$X = A'B'C + A'BC + AB'C + ABC$$

on solving we get

$$Z = A \oplus B \oplus C$$

