OBJECTIVE:

Study of Binary to gray code conversion.

EQUIPMENT NEEDED:

Component	Quantity
① IC 7486 2 input XOR gate	1

THEORY:

Gray Code

The gray code belongs to a class of codes called minimum change codes, in which only one bit in the code changes when moving from one code to the next. The gray code is non-weighted, as the position of bit does not contain any weight. The gray code is reflective digital code which has the special property that any two subsequent numbers codes differ by only one bit. This is also called a unit distance code.

Example: write gray code of 7

step 1 BCD code of 7 = 0111

step 2: Keep the MSB of BCD same & then add it with the next digit, ignore carry bit in each case
0111 = 0100

PROCEDURE :
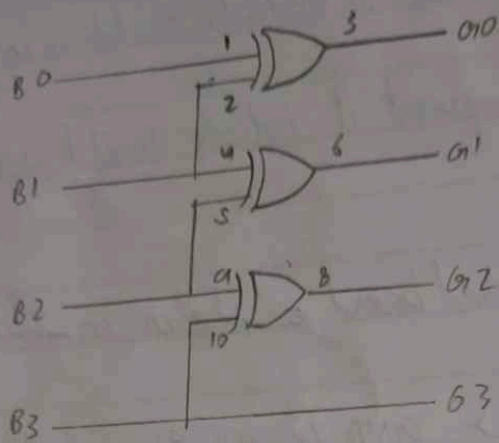
when switch is pressed it indicates switch is in 'high' position.
when switch is unpressed it indicate switch is in 'law' position

① Make connections on bread board as shown in position figure

② Connect +5v to pin 14 & GND to pin 7

③ Connect inputs I0 & I3 to B0-B3 respectively

④ Connect outputs G0 & G3 to O0-O3 of 10 bit LED indicator.

⑤ Switch on the kit.

⑥ Set input switches S0-S3 initially to law position

⑦ Observe outputs, G0,G1,G2,G3 on led L3, L2, L1, L0.

⑧ Verify truth table for different input combinations

LOGIC DIAGRAM

Binary Code				Gray code			
B3	B2	B1	B0	G3	G2	G1	G0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	0	0	0	1	1
0	0	1	1	0	0	1	0
0	1	0	0	0	1	0	0
0	1	0	1	0	1	0	1
0	1	1	0	0	1	1	1
0	1	1	1	0	1	1	0
1	0	0	0	1	0	0	0
1	0	0	1	1	0	0	1
1	0	1	0	1	0	1	1
1	0	1	1	1	0	1	1
1	1	0	0	1	0	1	0
1	1	0	1	1	1	0	0
1	1	0	1	0	1	0	0
1	1	1	0	1	1	1	1
1	1	1	1	1	1	1	0

Conclusion :

Binary to gray code conversion is studied. Most significant bit of binary as well as gray code is same as far as 4 bit code is concerned

Assessment of the Experiment / Assignment :

Timely Submission (07)	Presentation (06)	Understanding (12)	Total (25)	Signature of Teacher with date
07	06	11	24	*Patil* 30/09/24