CLASS: S.E.COMP **SUBJECT :DEL**

EXPT. NO.:2 **DATE:**

TITLE : CODE CONVERTER

OBJECTIVE :

1. Design and Implement 4-bit Binary to Gray code converter using minimum number of logic gates and Vice-versa
2. Design and Implement Excess-3 to BCD code converter using minimum number of logic gates and Vice-versa

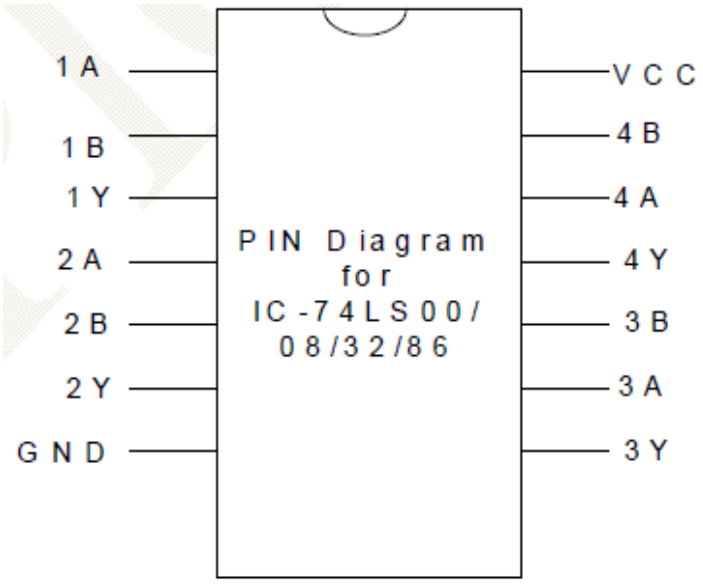
APPARATUS :

Digital-Board, GP-4Patch-Cords, IC-74LS86, IC-74LS32, IC-74LS08 / IC-74LS04 and Required Logic gates if any.

THEORY :

Code converter is combinational logic circuits, which can be used to convert one number system to another. Binary code is a weighted code having base 2.Gray code is a code in which one bit change is obtained; Gray code is also called *unit distance code or reflected code*. BCD code is basically a 4-bit binary code but it is valid from 0 to 9. Excess-3 code is basically 4-bit binary code which can be obtained by adding 3 to each binary, that is Excess-3 code are valid from 3 to 15.Excess-3 code is Non-Weighted code.Excess-3 code is also called as *sequential code or self-complementary code.*

PIN DIAGRAM:



PROCEDURE :

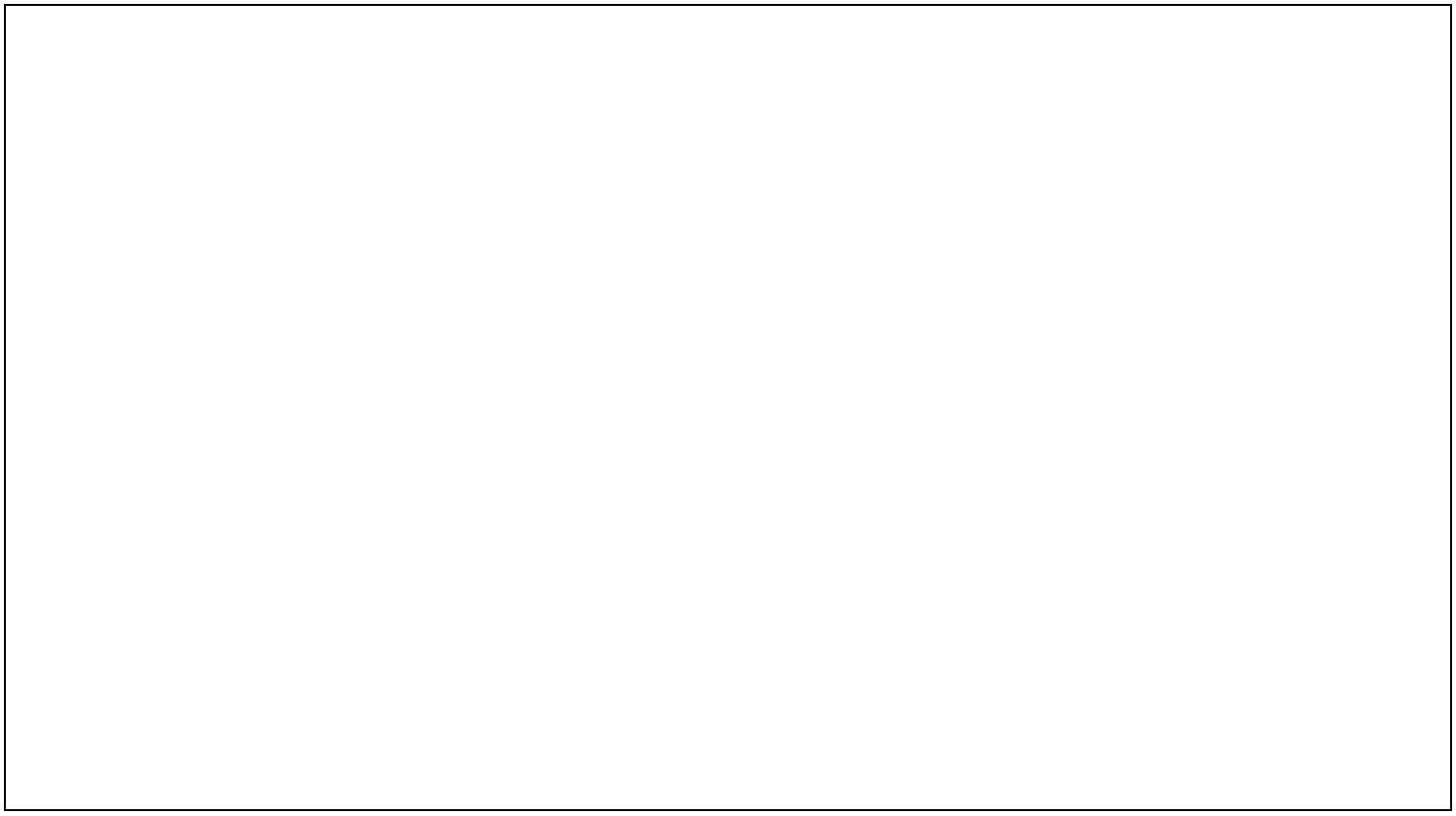
1. Make the connections as per the Logic circuit of 4-bit Binary to 4-bit Gary Code converter and Vice-versa and Verify its Truth Table.
2. Make the connections as per the Logic circuit of 4-bit BCD to 4-bit Excess-3 Code converter and Vice-versa and Verify its Truth Table

Design of 4-bit Binary to Gray code converter

Dec. Equ.	*Binary code Input*				Gray code Output			
	B_3	B_2	B_1	B_0	G_3	G_2	G_1	G_0

K-Map Simplification for G_3, G_2, G_1, G_o

Logic Diagram:



Design of 4-bit Gray to Binary code converter

Dec.Equ.	*Gray code Input*				Binary code Output			
	G_3	G_2	G_1	G_0	B_3	B_2	B_1	B_0

Dec.Equ.	*Gray code Input*				Binary code Output			
	G_3	G_2	G_1	G_0	B_3	B_2	B_1	B_0

K-Map Simplification for B_3, B_2, B_1, B_o

Logic Diagram:

Design of BCD code to Excess-3Code converter

Dec.Equ.	*BCD code Input*				Excess-3 code Output			
	B_3	B_2	B_1	B_0	E_3	E_2	E_1	E_0

Dec.Equ.	*BCD code Input*				Excess-3 code Output			
	B_3	B_2	B_1	B_0	E_3	E_2	E_1	E_0

K-Map Simplification for E3, E2, E1, Eo

Logic Diagram:

Design of Excess-3 code to BCD Code converter

Dec.Equ.	Excess-3 *code Input*				*BCD* code Output			
	E_3	E_2	E_1	E_0	B_3	B_2	B_1	B_0

Dec.Equ.	Excess-3 *code Input*				*BCD* code Output			
	E_3	E_2	E_1	E_0	B_3	B_2	B_1	B_0

K-Map Simplification for B_3, B_2, B_1, B_o

Logic Diagram:

Logic Gates / MSI Device required for Implementation:

Sr.No.	Title	Name of the IC	Number of Gates	IC Required
01	Binary to Gray code			
	Gray to Binary code			
02	BCD to Excess-3code			
	Excess-3to BCD			

CONCLUSION:

REFFRENCE:

1. **R.P.Jain "Modern Digital Electronics" TMH 4th Edition**
2. **D.Leach,Malvino,Saha,"Digital Principles and Applications",TMH**

Subject teacher Sign with Date Remark