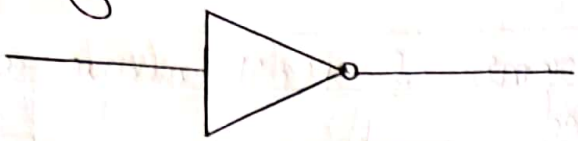
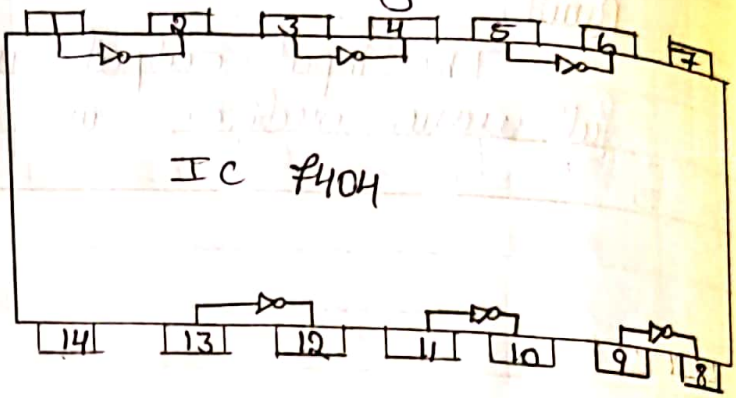
1. NOT Gate

Symbol



Pin diagram GND

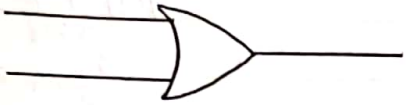


Truth table

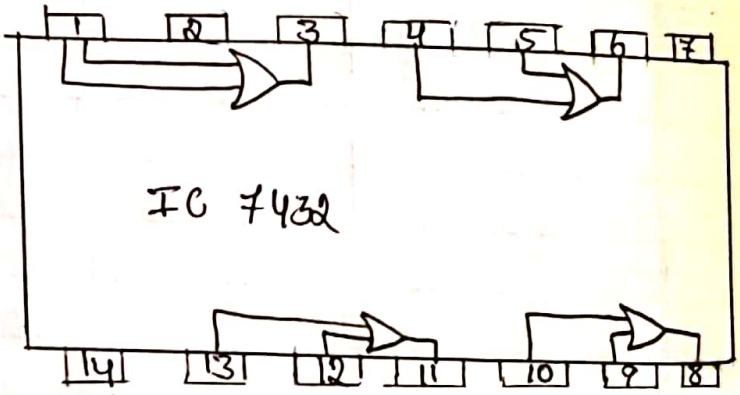
I/P	O/P
0	1
1	0

2. OR Gate

Symbol



Pin diagram GND

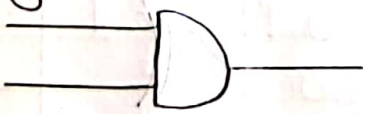


Truth table

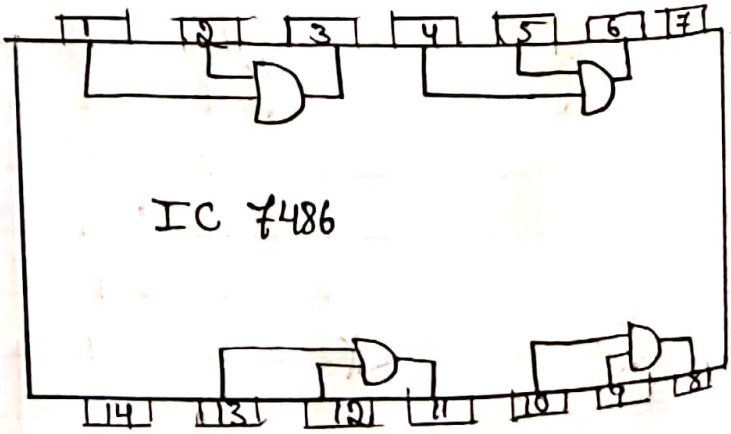
A	B	O/P
0	0	0
0	1	1
1	0	1
1	1	1

3. AND Gate

Symbol



Pin diagram GND



Truth table

A	B	O/P
0	0	0
0	1	0
1	0	0
1	1	1

Experiment No. : ..... Date: ..... Page No.: .....

Name of the Experiment : i] Binary to Grey ii] Grey to Binary

Aim:

Design and implement code converter
i] Binary to Grey
ii] Grey to Binary code

APPARATUS:

* Digital IC trainer kit
* Patch cords
* IC-7486

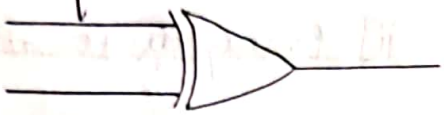
THEORY:

* There is a wide variety of binary code used in digital systems. Some of these are binary-coded decimal [BCD], Gray etc. it is required to convert from one code to another.

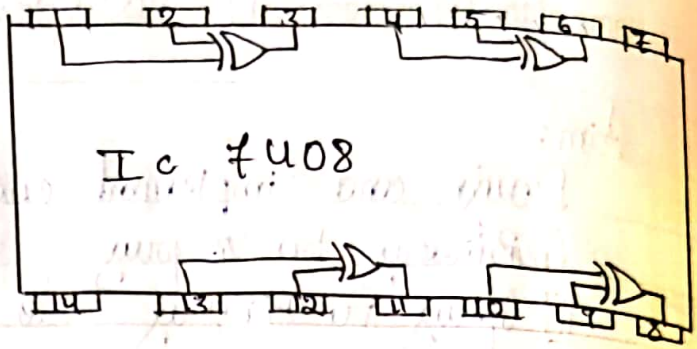
i] Binary code:

It is a straight binary code. The binary number system represents values using 2 symbols typically 0 and 1. computers call these bits as either off (0) and on (1) it is a weight code. Since is a weight is assigned to every position

4. XOR Gate



Pin Diagram GND



Truth table

A	B	O/P
0	0	0
0	1	0
1	0	0
1	1	1

Binary to Grey

$(0101)_B \rightarrow$

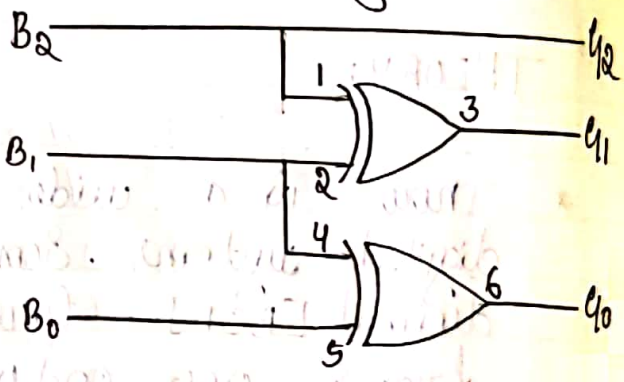
MSN LSN

$\therefore \quad G_2 = B_2$

$G_1 = B_2 \oplus B_1$

$G_0 = B_1 \oplus B_0$

Circuit diagram.



Truth table

Decimal equivalent	Binary code			Grey code		
	B_2	B_1	B_0	G_2	G_1	G_0
0	0	0	0	0	0	0
1	0	0	1	0	0	1
2	0	1	0	0	1	1
3	0	1	1	0	1	0
4	1	0	0	1	0	0
5	1	0	1	1	0	1
6	1	1	0	1	1	1
7	1	1	1	1	1	0

Experiment No. : ..... Date: ..... Page No.: .....

Name of the Experiment : .....

ii] Gray code:

It is a modified binary code in which a decimal number is represented in binary form in such a way that each gray-code number differs from Preceding and that succeeding number by a single-bit. Gray code is non-weighted code it is more useful to use Gray code than binary code.

Gates and Pin diagrams

i] Binary to Gray conversion

→ In this conversion the input straight binary number can easily be converted to its Gray code equivalent.

1. Record the most significant bit as it is
2. Ex-OR this bit to the next position bit record the resultant bit
3. Record successive Ex-ORed bits until completed.
4. Convert $(0101)_B$ to Gray.

Gray to Binary

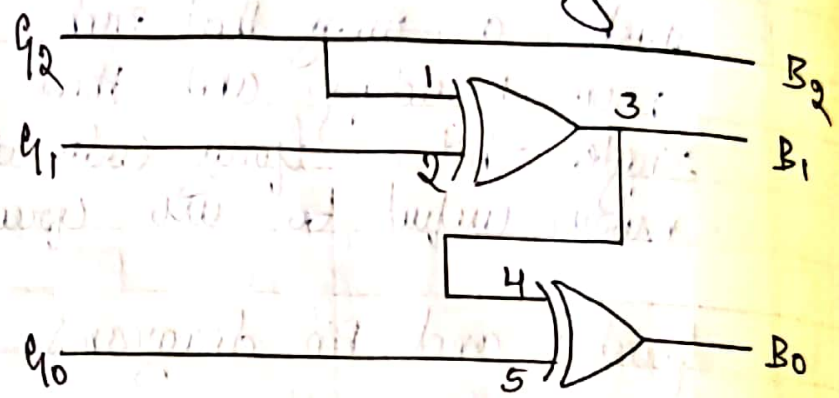
Ex: 1101 G => 1000

$\therefore B_2 = G_2$

$B_1 = B_2 \oplus G_1 = G_2 \oplus G_1$

$B_0 = B_1 \oplus G_0 = G_2 \oplus G_1 \oplus G_0$

circuit diagram



Gray code			Binary code		
G_2	G_1	G_0	B_2	B_1	B_0
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	0	0	1	0	0
1	0	1	1	0	1
1	1	1	1	1	0
1	1	0	1	1	1

Experiment No. : .....Date: .....Page No.:.....

Name of the Experiment : .....

ii) Gray to Binary Conversion :

1. The Gray code can be converted to binary by a similar process.
2. Record the most significant bit as it is
3. Ex-OR binary MSB to the next bit of the Gray code and record the resultant bit
4. Continue the process until the LSB is recorded
5. Convert (110)$_4$ Gray to Binary.