EXPERIMENT NO:-5

➢ **AIM:** To design and test 4-bit Binary to Gray and Gray to Binary Converter circuits.

➢ **APPARATUS:** Logic trainer, LED's, Digital IC 7486, Connecting wires.
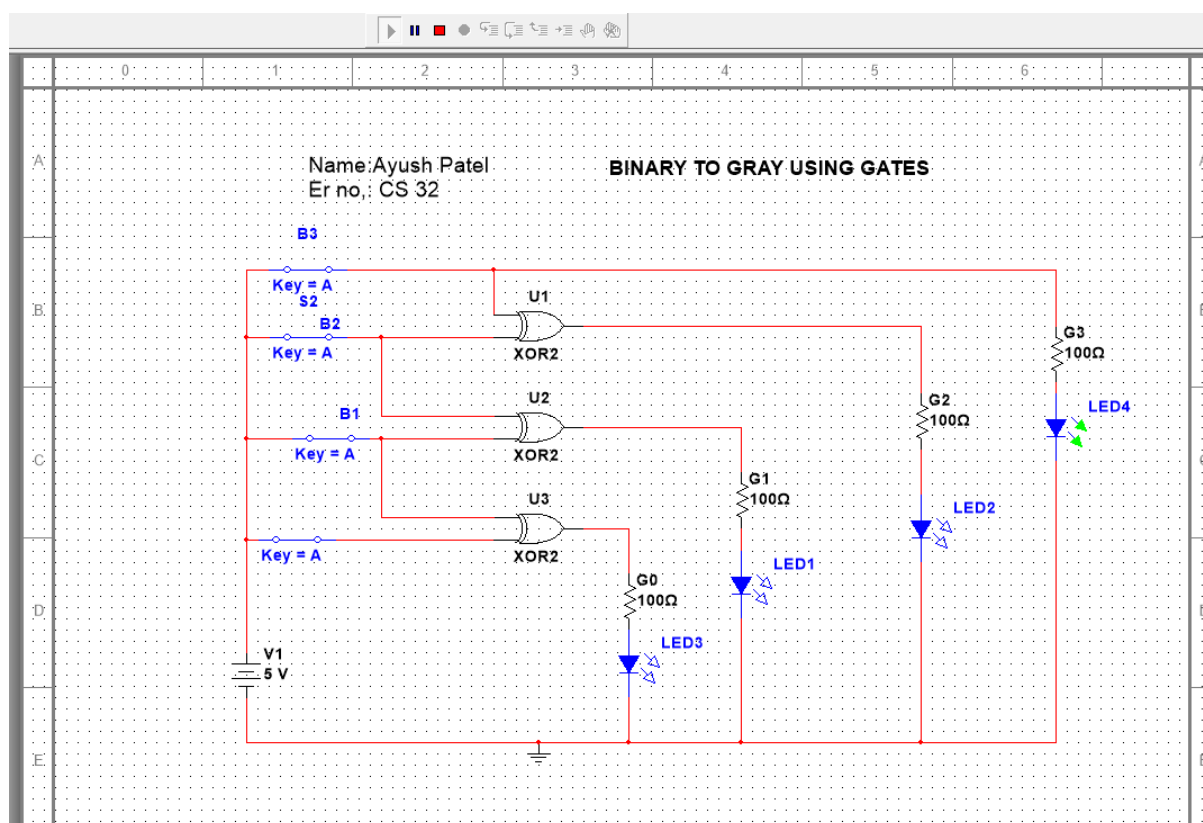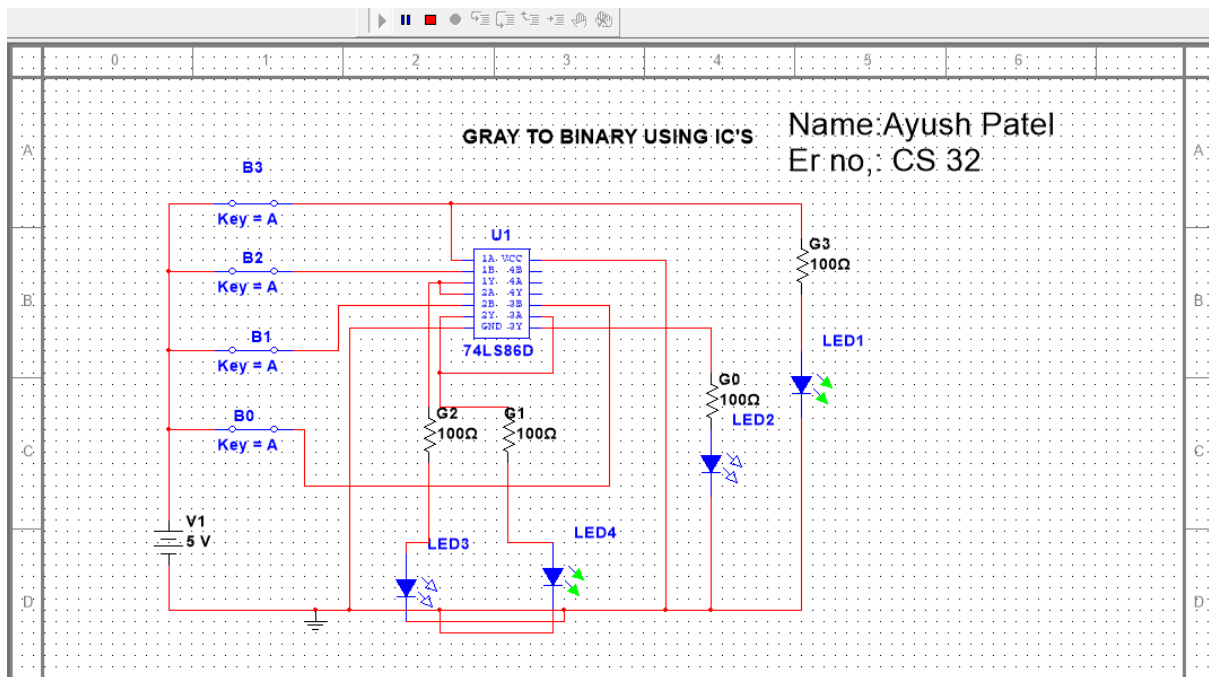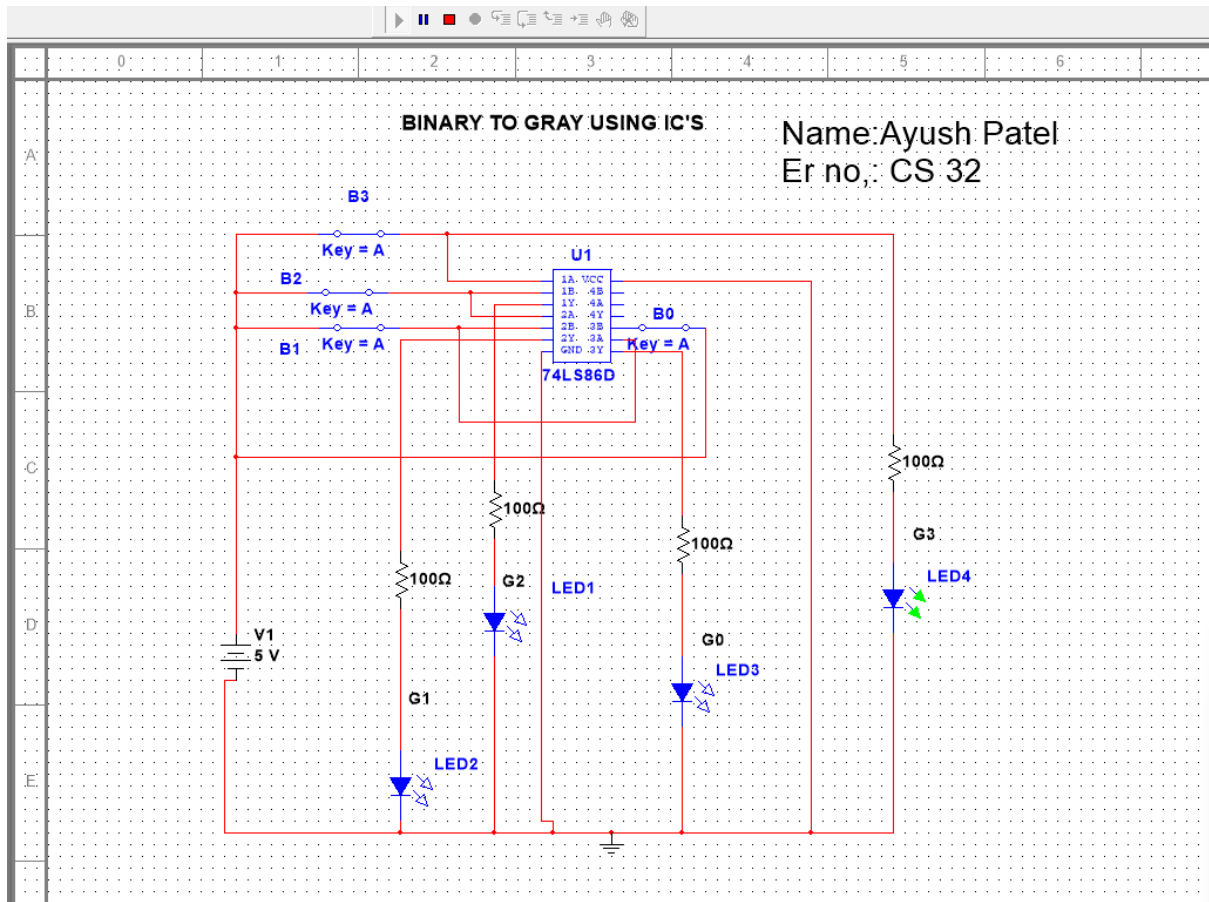
➢ **THEORY:**

Computers and other digital circuits are required to handle data that may be numerical alphabet or special character. Since digital circuit in binary fashion, the numerical, alphabets and other special characters are required to be converted into binary format. There are various possible ways of doing this, which is called encoding. Some commonly used binary codes are BCD, Excess-3 and Gray etc.
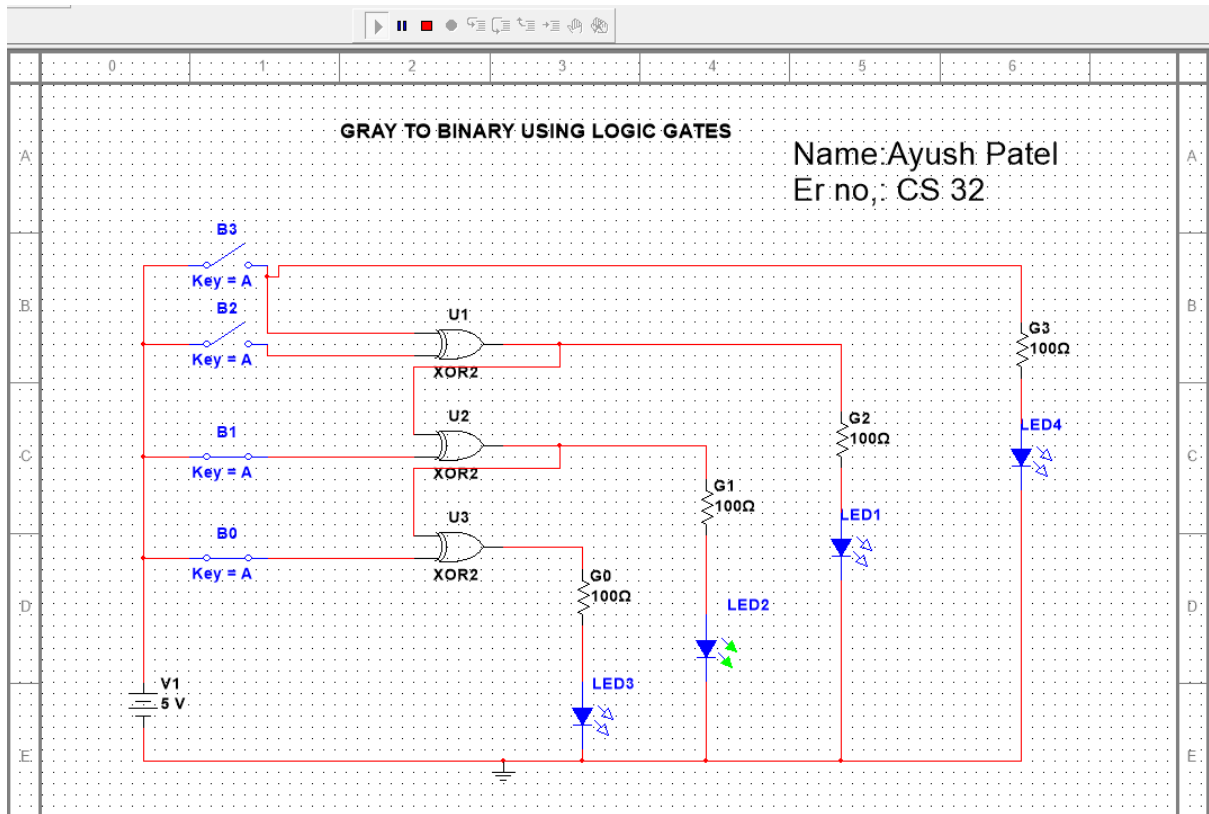
Many physical systems provide continuous data at their output. This data must be converted in to digital form before they are applied to a digital system. Continuous analog information is converted to digital form by means of analog to digital converter. Here it is useful to use the reflected (or gray) code to represent digital data converted from analog data. The advantage of reflected code over pure binary number is that the reflected code changes only be one bit as it proceeds from one number to the next

Binary to Gray and Gray to Binary:

(It includes circuit description, truth table, circuit diagram and logical explanation.)

BINARY TO GRAY USING IC'S

Name:Ayush Patel
Er no,: CS 32

B3
Key = A

B2
Key = A

B1   Key = A

U1
1A. VCC
1B. .4B
1Y. .4A
2A. .4Y
2B. .3B
2Y. .3A
GND .3Y

B0
Key = A

74LS86D

100Ω

100Ω

100Ω

100Ω

G3

G2

LED4

LED1

G0

LED3

V1
5 V

G1

LED2

GRAY TO BINARY USING IC'S

Name:Ayush Patel
Er no,: CS 32

B3
Key = A

B2
Key = A

B1
Key = A

U1
1A. VCC
1B. .4B
1Y. .4A
2A. .4Y
2B. .3B
2Y. .3A
GND .3Y

74LS86D

G3
100Ω

LED1

G0
100Ω

LED2

B0
Key = A

G2
100Ω

G1
100Ω

V1
5 V

LED3

LED4

GRAY TO BINARY USING LOGIC GATES

Name:Ayush Patel
Er no,: CS 32

> **PROCEDURE:**

1. Write down the code conversion table, simplify Boolean function for each bit using K-map.

2. Select appropriate ICs to realize the simplified Boolean function.

3. Switch ON the power supply.

4. Apply appropriated set of inputs and observe the output.

CODE CONVERSION TABLE:

BINARY				GRAY			
B_3	B_2	B_1	B_0	G_3	G_2	G_1	G_0
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	0
1	1	0	0	1	1	0	0
1	1	0	1	1	1	0	1
1	1	1	0	1	1	1	1
1	1	1	1	1	1	1	0

CONCLUSION:

By doing this practical we verify 4-bit Binary To Gray and Gray to Binary Converter circuits