

1) Binary TO Excess 3 Code Conversion

Truth Table:-

Decimal	B3	B2	B1	B0	E3	E2	E1	E0
0	0	0	0	0	0	0	1	1
1	0	0	0	1	1	0	1	0
2	0	0	1	0	0	0	1	0
3	0	0	1	1	0	0	1	1
4	0	1	0	0	0	0	1	1
5	0	1	0	1	1	1	0	0
6	0	1	1	0	0	1	0	1
7	0	1	1	1	1	1	0	1
8	1	0	0	0	0	1	0	1
9	1	0	0	1	1	1	1	0

K-Maps:-

B3/B1	00	01	11	10
00	1	0	1	0
01	1	0	1	0
11	X	X	X	X
10	1	0	X	X

$$E1 = B1 \oplus B0$$

B3B2/B1B0	00	01	11	10
00	1	0	0	1
01	1	0	0	1
11	X	X	X	X
10	1	0	X	X

$$E0 = B'0$$

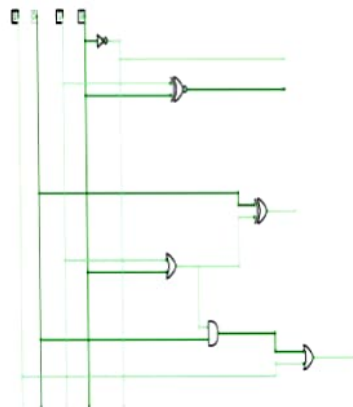
B3B2/B1B0	00	01	11	10
00	1	1	1	1
01	1	0	0	0
11	X	X	X	X
10	1	1	X	X

$$E2 = B2 \oplus (B1 + B0)$$

B3B2/B1B0	00	01	11	10
00	0	1	1	1
01	0	1	1	1
11	X	X	X	X
10	1	1	X	X

$$E2 = B3 + B2(B0 + B1)$$

Circuit Diagram

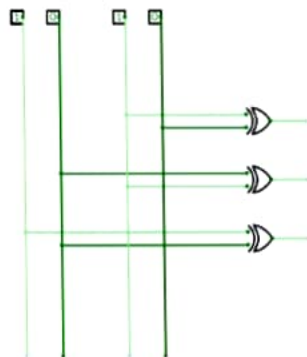


1) Binary TO Grey Code Conversion

Truth Table:-

Decimal	B3	B2	B1	B0	G3	G2	G1	G0
0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	1
2	0	0	1	0	0	0	1	1
3	0	0	1	1	0	0	1	0
4	0	1	0	0	0	1	1	1
5	0	1	0	1	0	1	1	1
6	0	1	1	0	0	1	0	0
7	0	1	1	1	0	1	0	1
8	1	0	0	0	1	1	0	1
9	1	0	0	1	1	1	0	0
10	1	0	1	0	1	1	1	1
11	1	0	1	1	1	1	1	1
12	1	1	0	0	1	0	1	0
13	1	1	0	1	1	0	1	1
14	1	1	1	0	1	0	0	1
15	1	1	1	1	1	0	0	0

Circuit Diagram



K-Maps:-

B3B2/B1B0

	00	01	11	10
00	0	0	1	1
01	1	1	0	0
11	1	1	0	0
10	0	0	1	1

$$G_1 = B_2 \oplus B_1$$

B3B2/B1B0

	00	01	11	10
00	0	0	0	0
01	1	1	1	1
11	0	0	0	0
10	1	1	1	1

$$G_2 = B_3 \oplus B_2$$

B3B2/B1B0

	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	1	1	1	1
10	1	1	1	1

$$G_3 = B_3$$

B3B2/B1B0

	00	01	11	10
00	0	1	0	1
01	0	1	0	1
11	0	1	0	1
10	0	1	0	1

$$G_0 = B_1 \oplus B_0$$