# EXPERIMENT NO.: - 8

**AIM*:***To study BCD to Excess-3 converter.

**THEORY:**

Excess-3 binary code is a unweighted self-complementary BCD code. Self-Complementary property means that the 1’s complement of an excess-3 number is the excess-3 code of the 9’s complement of the corresponding decimal number. This property is useful since a decimal number can be nines’ complemented (for subtraction) as easily as a binary number can be ones’ complemented; just by inverting all bits.

**TRUTH TABLE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| BCD | | | | Excess-3 | | | |
| A | B | C | D | W | X | Y | Z |
| 0 | 0 | 0 | 0 |  |  |  |  |
| 0 | 0 | 0 | 1 |  |  |  |  |
| 0 | 0 | 1 | 0 |  |  |  |  |
| 0 | 0 | 1 | 1 |  |  |  |  |
| 0 | 1 | 0 | 0 |  |  |  |  |
| 0 | 1 | 0 | 1 |  |  |  |  |
| 0 | 1 | 1 | 0 |  |  |  |  |
| 0 | 1 | 1 | 1 |  |  |  |  |
| 1 | 0 | 0 | 0 |  |  |  |  |
| 1 | 0 | 0 | 1 |  |  |  |  |
| 1 | 0 | 1 | 0 | X | X | X | X |
| 1 | 0 | 1 | 1 | X | X | X | X |
| 1 | 1 | 0 | 0 | X | X | X | X |
| 1 | 1 | 0 | 1 | X | X | X | X |
| 1 | 1 | 1 | 0 | X | X | X | X |
| 1 | 1 | 1 | 1 | X | X | X | X |

|  |  |
| --- | --- |
| **K-MAP FOR W** | **K-MAP FOR X** |

|  |  |
| --- | --- |
| **K-MAP FOR Y** | **K-MAP FOR Z** |

**CIRCUIT:**

**CONCLUSION:**

# EXPERIMENT NO.: - 8 B

**AIM*:***To study Excess-3 to BCD converter.

**THEORY:**

Excess-3 binary code is an unweighted self-complementary BCD code. Self-Complementary property means that the 1’s complement of an excess-3 number is the excess-3 code of the 9’s complement of the corresponding decimal number. This property is useful since a decimal number can be nines’ complemented (for subtraction) as easily as a binary number can be ones’ complemented; just by inverting all bits.

**TRUTH TABLE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Excess-3 | | | | BCD | | | |
| W | X | Y | Z | A | B | C | D |
| 0 | 0 | 0 | 0 | X | X | X | X |
| 0 | 0 | 0 | 1 | X | X | X | X |
| 0 | 0 | 1 | 0 | X | X | X | X |
| 0 | 0 | 1 | 1 |  |  |  |  |
| 0 | 1 | 0 | 0 |  |  |  |  |
| 0 | 1 | 0 | 1 |  |  |  |  |
| 0 | 1 | 1 | 0 |  |  |  |  |
| 0 | 1 | 1 | 1 |  |  |  |  |
| 1 | 0 | 0 | 0 |  |  |  |  |
| 1 | 0 | 0 | 1 |  |  |  |  |
| 1 | 0 | 1 | 0 |  |  |  |  |
| 1 | 0 | 1 | 1 |  |  |  |  |
| 1 | 1 | 0 | 0 |  |  |  |  |
| 1 | 1 | 0 | 1 | X | X | X | X |
| 1 | 1 | 1 | 0 | X | X | X | X |
| 1 | 1 | 1 | 1 | X | X | X | X |

|  |  |
| --- | --- |
| **K-MAP FOR A** | **K-MAP FOR B** |

|  |  |
| --- | --- |
| **K-MAP FOR C** | **K-MAP FOR D** |

**CIRCUIT:**

**CONCLUSION:**