# EXPERIMENT NO.: - 7 A

**AIM*:***To study Binary to Gray code converter.

**THEORY:**

Gray Code system is a binary number system in which every successive pair of numbers differs in only one bit. It is used in applications in which the normal sequence of binary numbers generated by the hardware may produce an error or ambiguity during the transition from one number to the next. For example, the states of a system may change from 3(011) to 4(100) as- 011 — 001 — 101 — 100. Therefore, there is a high chance of a wrong state being read while the system changes from the initial state to the final state. This could have serious consequences for the machine using the information. The Gray code eliminates this problem since only one bit changes its value during any transition between two numbers.

**TRUTH TABLE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Binary | | | | Gray Code | | | |
| 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 |  |  |  |  |
| 1 | 0 | 1 | 1 |  |  |  |  |
| 1 | 1 | 0 | 0 |  |  |  |  |
| 1 | 1 | 0 | 1 |  |  |  |  |
| 1 | 1 | 1 | 0 |  |  |  |  |
| 1 | 1 | 1 | 1 |  |  |  |  |

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

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

**CIRCUIT:**

**CONCLUSION:**

# EXPERIMENT NO.: - 7 B

**AIM*:***To study Gray code to Binary converter.

**TRUTH TABLE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Gray Code | | | | Binary | | | |
| W | X | Y | Z | A | B | C | D |
| 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 |  |  |  |  |
| 1 | 0 | 1 | 1 |  |  |  |  |
| 1 | 1 | 0 | 0 |  |  |  |  |
| 1 | 1 | 0 | 1 |  |  |  |  |
| 1 | 1 | 1 | 0 |  |  |  |  |
| 1 | 1 | 1 | 1 |  |  |  |  |

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

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

**CIRCUIT:**

**CONCLUSION:**