A)

010

110

011

101

100

000

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **J2** | **Q1Q0** | | | |
| **Q2** | **00** | **01** | **11** | **10** |
| **0** | 0 | X | 1 | 1 |
| **1** | X | X | X | X |

J2 = Q1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **K2** | **Q1Q0** | | | |
| **Q2** | **00** | **01** | **11** | **10** |
| **0** | X | X | X | X |
| **1** | 1 | 0 | X | 1 |

K2 = Q0’

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **J1** | **Q1Q0** | | | |
| **Q2** | **00** | **01** | **11** | **10** |
| **0** | 1 | X | X | X |
| **1** | 0 | 0 | X | X |

J1 = Q2’

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **K1** | **Q1Q0** | | | |
| **Q2** | **00** | **01** | **11** | **10** |
| **0** | X | X | 1 | 0 |
| **1** | X | X | X | 0 |

K1 = Q0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **J0** | **Q1Q0** | | | |
| **Q2** | **00** | **01** | **11** | **10** |
| **0** | 0 | X | X | 0 |
| **1** | 0 | X | X | 1 |

J0 = Q1Q2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **K0** | **Q1Q0** | | | |
| **Q2** | **00** | **01** | **11** | **10** |
| **0** | X | X | 0 | X |
| **1** | X | 1 | X | X |

K0 = Q1’ or Q2

B)

0000

0001

0010

0011

0100

0101

0110

0111

1000

1001

Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Current  ABCD | Next ABCD | JAKA | JBKB | JCKC | JDKD |
| 0000 | 0001 | 0X | 0X | 0X | 1X |
| 0001 | 0010 | 0X | 0X | 1X | X1 |
| 0010 | 0011 | 0X | 0X | X0 | 1X |
| 0011 | 0100 | 0X | 1X | X1 | X1 |
| 0100 | 0101 | 0X | X0 | 0X | 1X |
| 0101 | 0110 | 0X | X0 | 1X | X1 |
| 0110 | 0111 | 0X | X0 | X0 | 1X |
| 0111 | 1000 | 1X | X1 | X1 | X1 |
| 1000 | 1001 | X0 | 0X | 0X | 1X |
| 1001 | 0000 | X1 | 0X | 0X | X1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **JA** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | 0 | 0 | 0 | 0 |
| **01** | 0 | 0 | 1 | 0 |
| **11** | X | X | X | X |
| **10** | X | X | X | X |

JA = BCD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KA** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | x | x | x | x |
| **01** | x | x | x | x |
| **11** | x | x | x | x |
| **10** | 0 | 1 | x | x |

KA = D

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **JB** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | 0 | 0 | 1 | 0 |
| **01** | x | x | x | x |
| **11** | x | x | x | x |
| **10** | 0 | 0 | x | x |

JB = CD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KB** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | x | x | x | x |
| **01** | 0 | 0 | 1 | 0 |
| **11** | x | x | x | x |
| **10** | 0 | 0 | x | x |

KB = CD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **JC** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | 0 | 1 | x | x |
| **01** | 0 | 1 | x | x |
| **11** | x | x | x | x |
| **10** | 0 | 0 | x | x |

JC = A’D

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KC** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | x | x | 1 | 0 |
| **01** | x | x | 1 | 0 |
| **11** | x | x | x | x |
| **10** | x | x | x | x |

KC = D

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **JD** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | 1 | x | x | 1 |
| **01** | 1 | x | x | 1 |
| **11** | x | x | x | x |
| **10** | 1 | x | x | 1 |

JD = 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **KD** | **CD** | | | |
| **AB** | **00** | **01** | **11** | **10** |
| **00** | x | 1 | 1 | x |
| **01** | 1 | x | x | 1 |
| **11** | x | x | x | x |
| **10** | 1 | x | x | 1 |

KD = 1