|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | B | C | D | a | b | c | d | e | f | g |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |

K-MAP

a

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 0 | 1 | 1 |
|  | 01 | 0 | 1 | 1 | 1 |
|  | 11 | 0 | 1 | 1 | 1 |
|  | 10 | 1 | 1 | 0 | 0 |

a = A’C + BD + BC + A’B’D’ + AB’C’

b

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 1 | 1 | 1 |
|  | 01 | 1 | 0 | 1 | 0 |
|  | 11 | 1 | 1 | 0 | 1 |
|  | 10 | 1 | 1 | 0 | 0 |

b = A’B’ + C’D’ + AC’ + A’CD + ABD’

c

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 1 | 1 | 0 |
|  | 01 | 1 | 1 | 1 | 1 |
|  | 11 | 1 | 1 | 1 | 1 |
|  | 10 | 1 | 1 | 0 | 0 |

c = C’ + B + A’D

d

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 0 | 1 | 1 |
|  | 01 | 0 | 1 | 0 | 1 |
|  | 11 | 0 | 0 | 1 | 1 |
|  | 10 | 1 | 1 | 0 | 0 |

d = A’B’D’ + A’B’C + A’CD’ + AB’C’ + ABC + A’BC’D

e

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 0 | 0 | 1 |
|  | 01 | 0 | 0 | 0 | 1 |
|  | 11 | 0 | 0 | 1 | 0 |
|  | 10 | 1 | 0 | 0 | 0 |

e = B’C’D’ + A’CD’ + ABCD

f

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 0 | 0 | 0 |
|  | 01 | 1 | 1 | 0 | 1 |
|  | 11 | 1 | 0 | 1 | 0 |
|  | 10 | 1 | 1 | 0 | 0 |

f = C’D’ + A’BC’ + A’BD’ + AB’C’ + ABCD

g

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | CD |  |  |  |
|  |  | 00 | 01 | 11 | 10 |
| AB | 00 | 0 | 0 | 1 | 1 |
|  | 01 | 1 | 1 | 0 | 1 |
|  | 11 | 1 | 0 | 1 | 1 |
|  | 10 | 1 | 1 | 1 | 1 |

g = B’C + BD’ + AB’ + AC + A’BC’