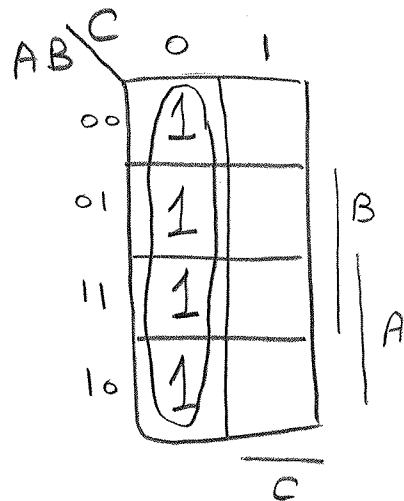


40 (d) $X = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C}$

$\downarrow \quad \quad \downarrow \quad \quad \downarrow \quad \quad \downarrow$
 000 100 010 110

$X = \bar{C}$



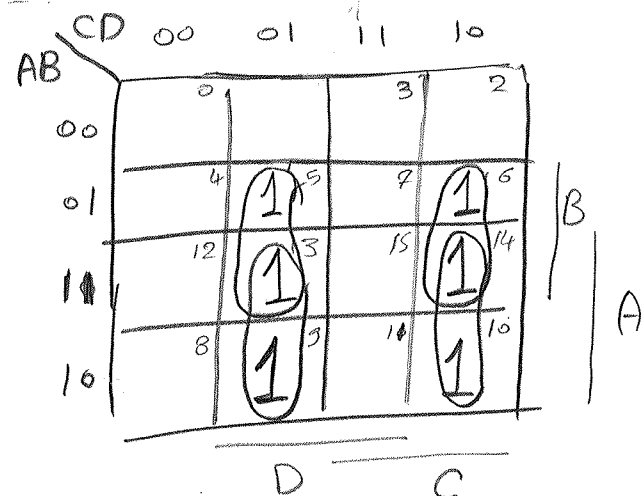
42 (c) $X = \bar{A}\bar{B}\bar{C}D + A\bar{C}\bar{D} + B\bar{C}D + \bar{A}BC\bar{D}$

$= \bar{A}\bar{B}\bar{C}D + A(B+\bar{B})\bar{C}\bar{D} + (A+\bar{A})B\bar{C}D + \bar{A}BC\bar{D}$

$= \bar{A}\bar{B}\bar{C}D + \bar{A}BC\bar{D} + A\bar{B}\bar{C}\bar{D} + ABC\bar{D} + \bar{A}B\bar{C}D + \bar{A}BCD$

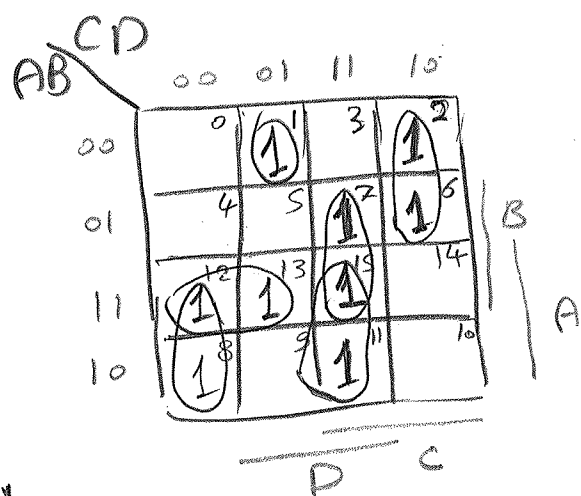
43 (c)

$X = \bar{B}\bar{C}D + A\bar{C}\bar{D} + B\bar{C}\bar{D} + A\bar{C}D$



46

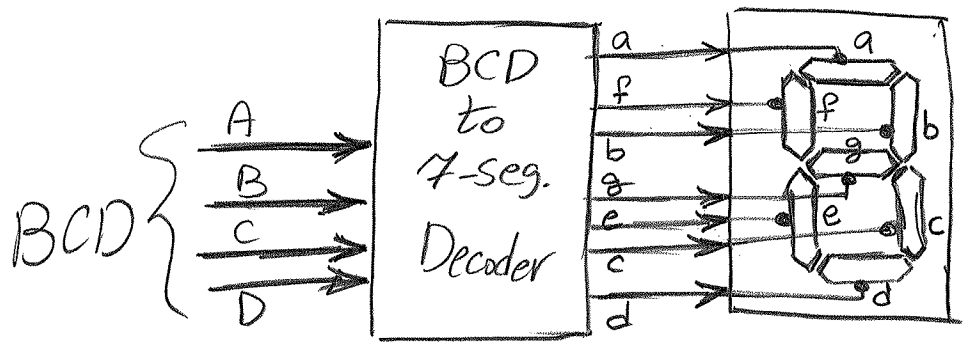
A	B	C	D	X
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	0



$X = \bar{A}\bar{C}\bar{D} +$
 $B\bar{C}D + A\bar{C}D +$
 $AB\bar{C} + A\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D$

Design Problem:

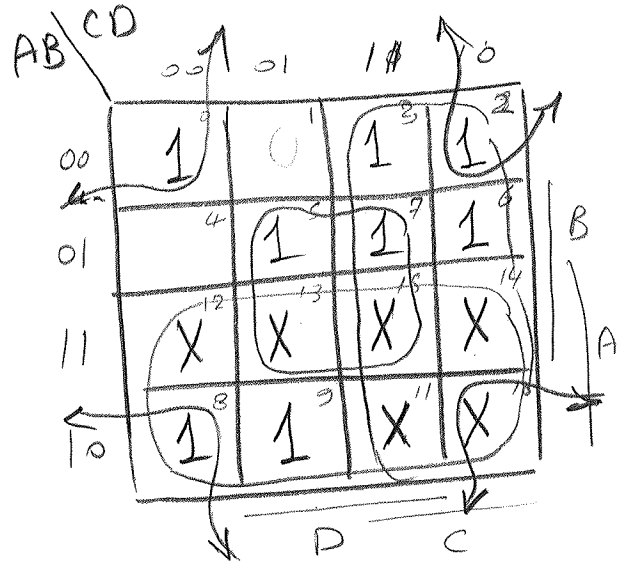
Design the logic circuit that controls the segment a



7-segment Display

(assuming common-cathode display \Rightarrow 1 turns segment on
0 turns segment off)

A	B	C	D	a
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	1	0	x
1	0	1	1	x
1	1	0	0	x
1	1	0	1	x
1	1	1	0	x



$$a = A + C + BD + \overline{B}\overline{D}$$