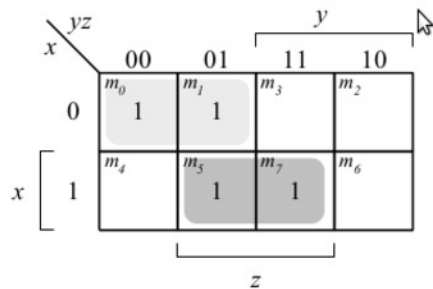
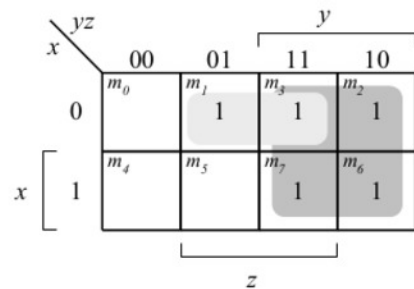


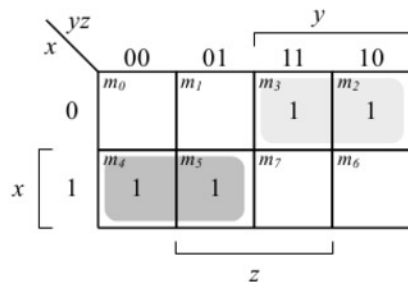
3.2



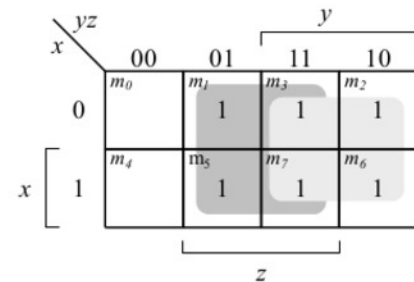
(a) $F = x'y' + xz$



(b) $F = y + x'z$

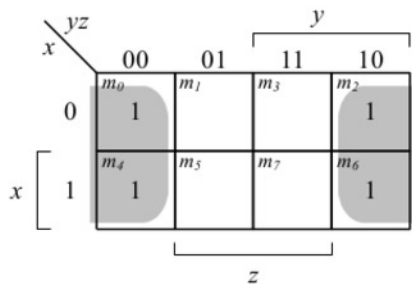


(c) $F = xy' + x'y$



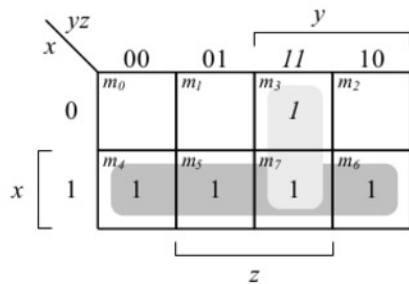
(d) $F = y + z$

3.2



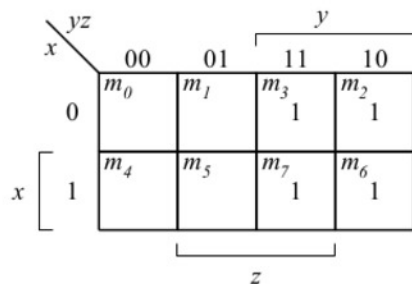
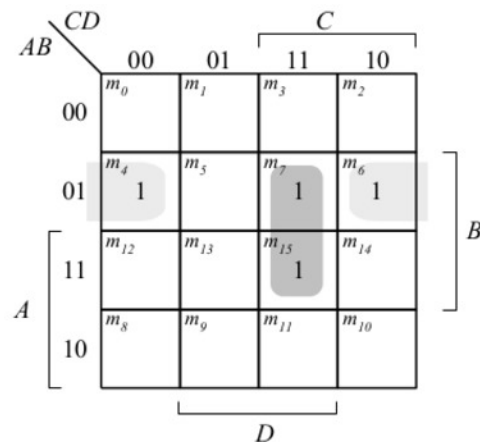
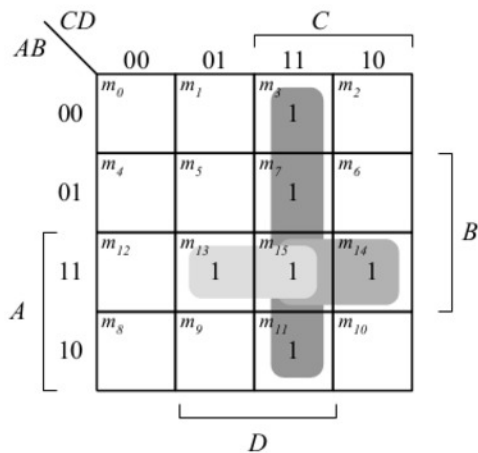
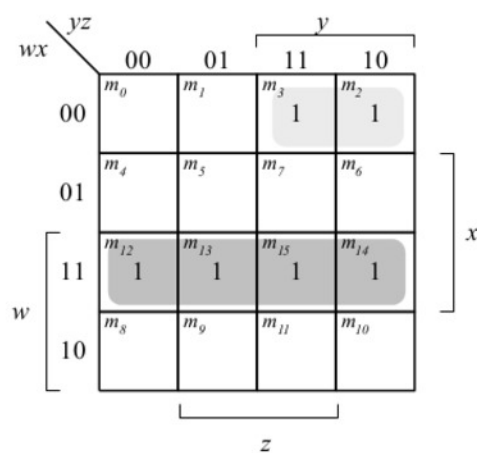
$$F = z'$$

(e)

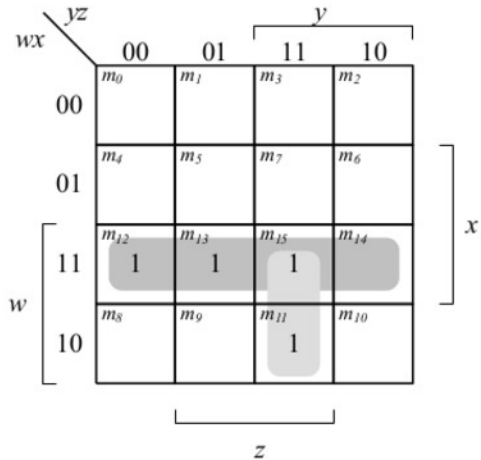


$$F = x + yz$$

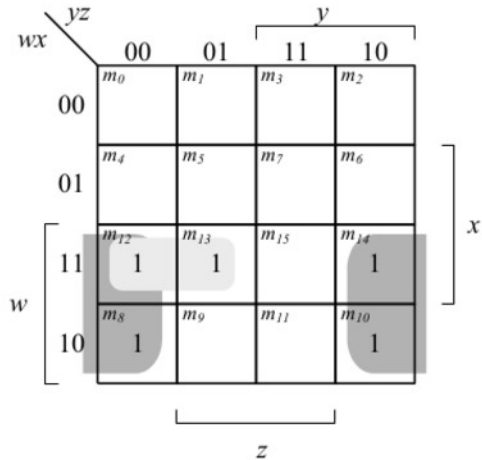
(f)

(a) $F = y$ (b) $F = BCD + A'BD'$ (c) $F = CD + ABD + ABC$ (d) $F = w'x'y + wx$

3.4

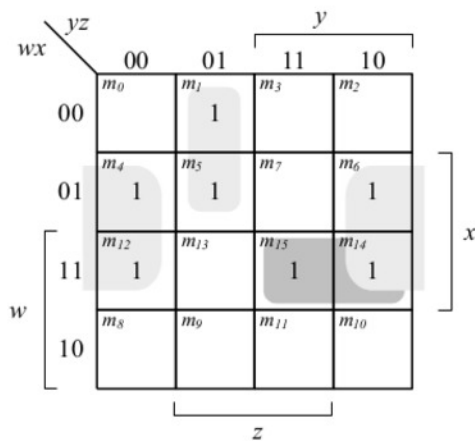


(e)

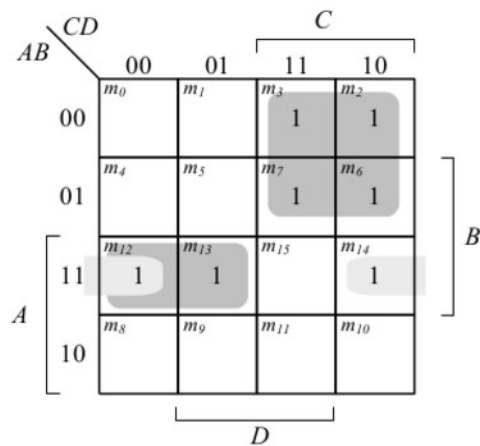


(f)

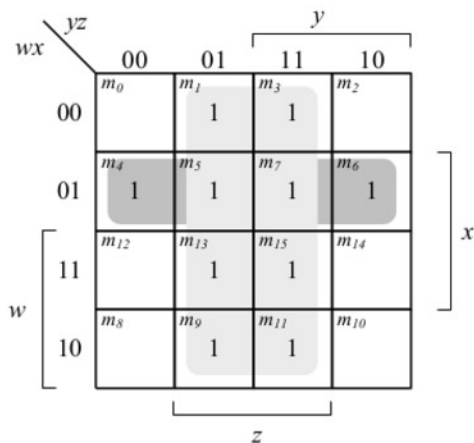
3.5



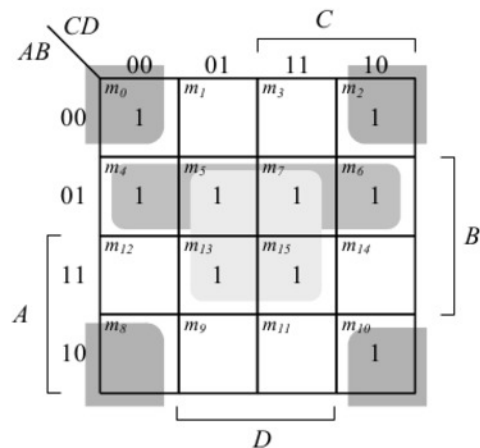
(a) $F = xz' + w'y'z + wxy$



(b) $F = A'C + ABC' + ABD'$
or
 $F = A'C + ABC' + BCD'$



(c) $F = z + xw'$



(d) $F = BD + A'B + B'D'$
or $F = BD + B'D' + A'D'$

3.8

(a) $F(x, y, z) = \Sigma(3, 5, 6, 7)$

		y			
		00	01	11	10
x	0	m_0	m_1	m_3 1	m_2
	1	m_4	m_5 1	m_7 1	m_6 1

z

(b) $F = \Sigma(1, 3, 5, 9, 12, 13, 14)$

		C			
		00	01	11	10
AB	00	m_0	m_1 1	m_3 1	m_2
	01	m_4	m_5 1	m_7	m_6
	11	m_{12} 1	m_{13} 1	m_{15}	m_{14} 1
	10	m_8	m_9 1	m_{11}	m_{10}

D

(c) $F = \Sigma(0, 1, 2, 3, 11, 12, 14, 15)$

		y			
		00	01	11	10
w	00	m_0 1	m_1 1	m_3 1	m_2 1
	01	m_4	m_5	m_7	m_6
	11	m_{12} 1	m_{13}	m_{15} 1	m_{14} 1
	10	m_8	m_9	m_{11} 1	m_{10}

z

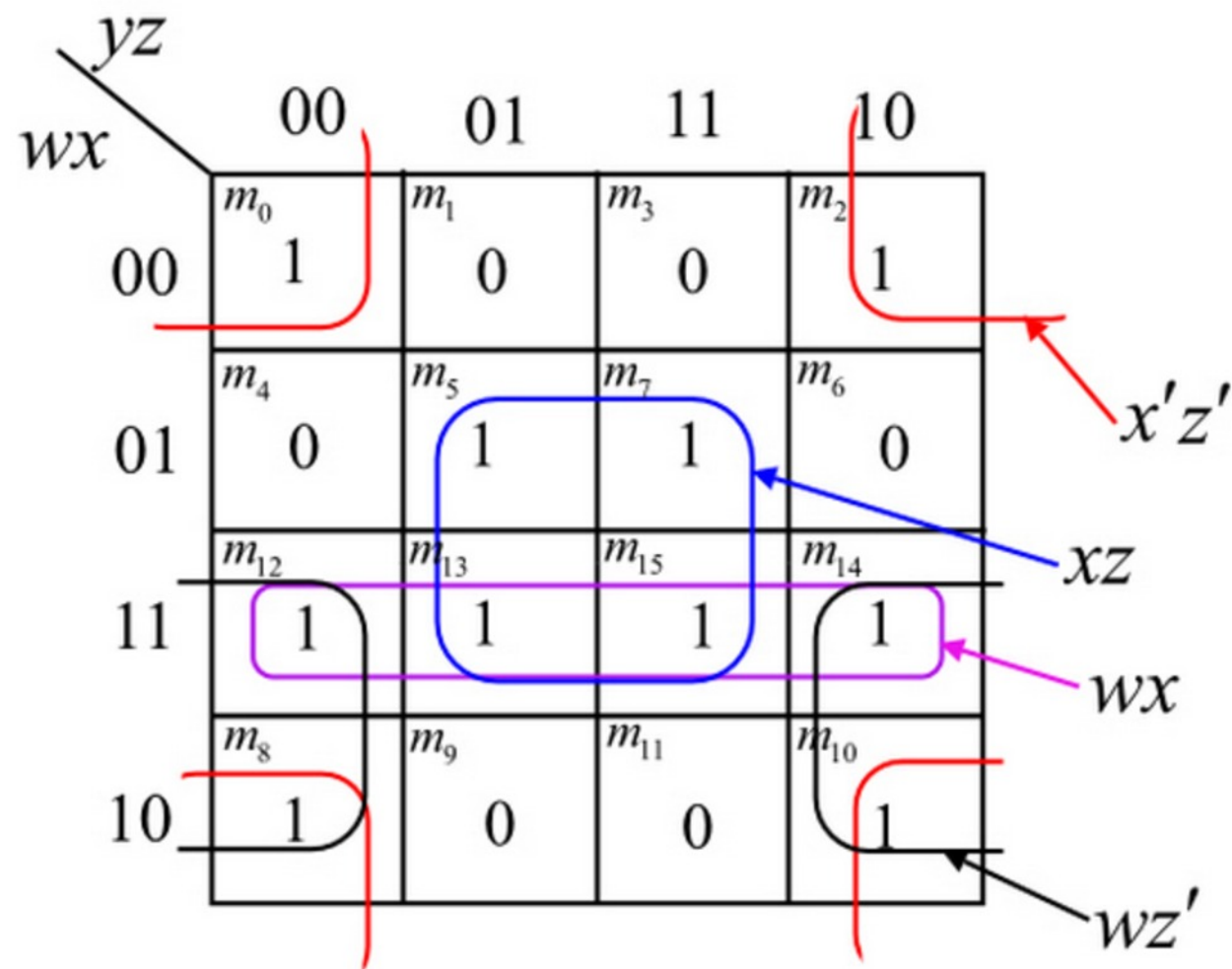
3.8

(d) $F = \Sigma(3, 4, 5, 6, 7, 11, 12)$

		CD			
		00	01	11	10
AB	00	m_0	m_1	m_3 1	m_2
	01	m_4 1	m_5 1	m_7 1	m_6 1
	11	m_{12} 1	m_{13}	m_{15}	m_{14}
	10	m_8	m_9	m_{11} 1	m_{10}

A is indicated by a bracket on the left side of the table, spanning rows 11 and 10 .
 B is indicated by a bracket on the right side of the table, spanning rows 01 and 11 .
 C is indicated by a bracket above the table, spanning columns 11 and 10 .
 D is indicated by a bracket below the table, spanning columns 11 and 10 .

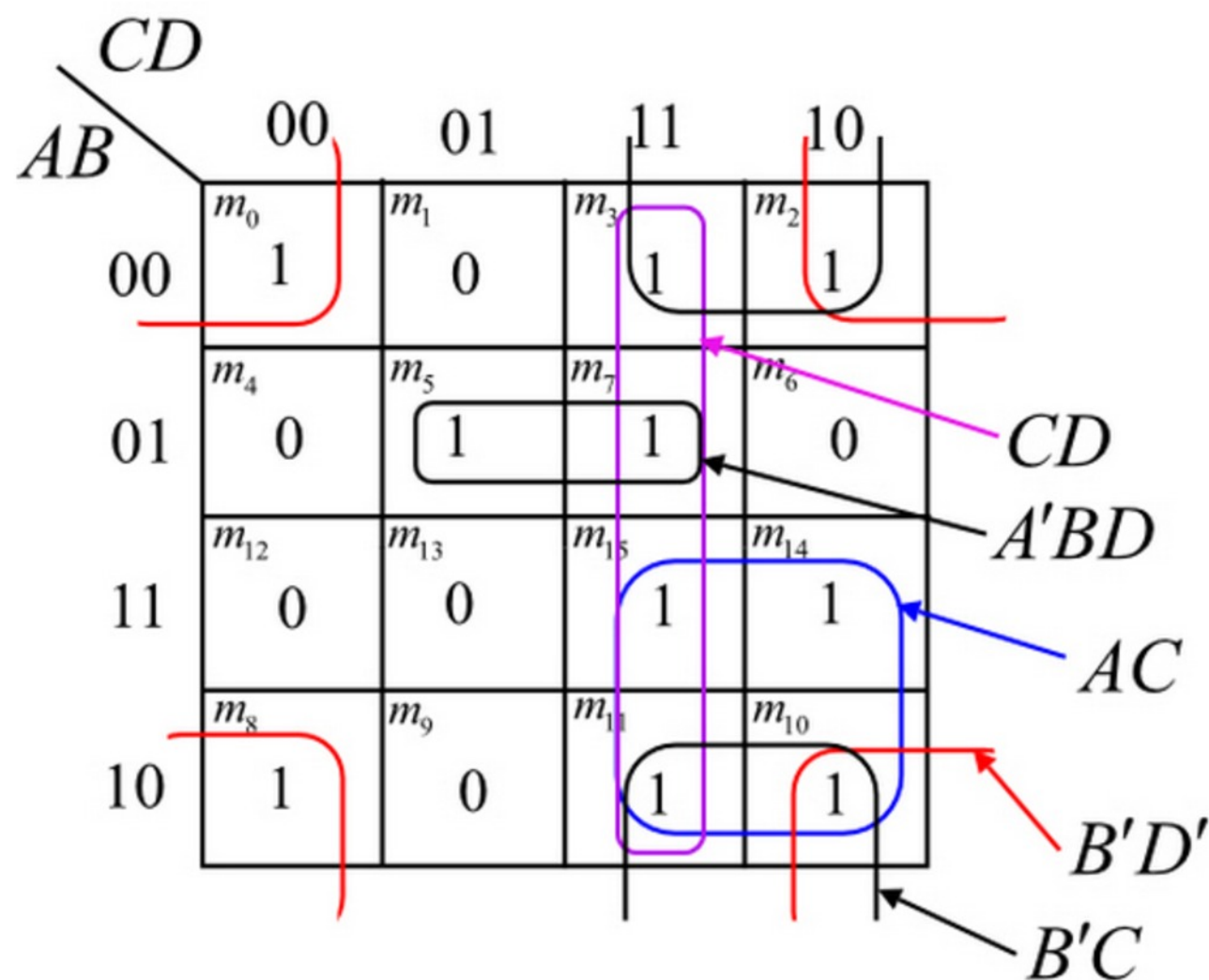
3.10 (a)



Prime Implicants: $x'z', xz, wx, wz'$

Essential Prime implicants: $x'z', xz$

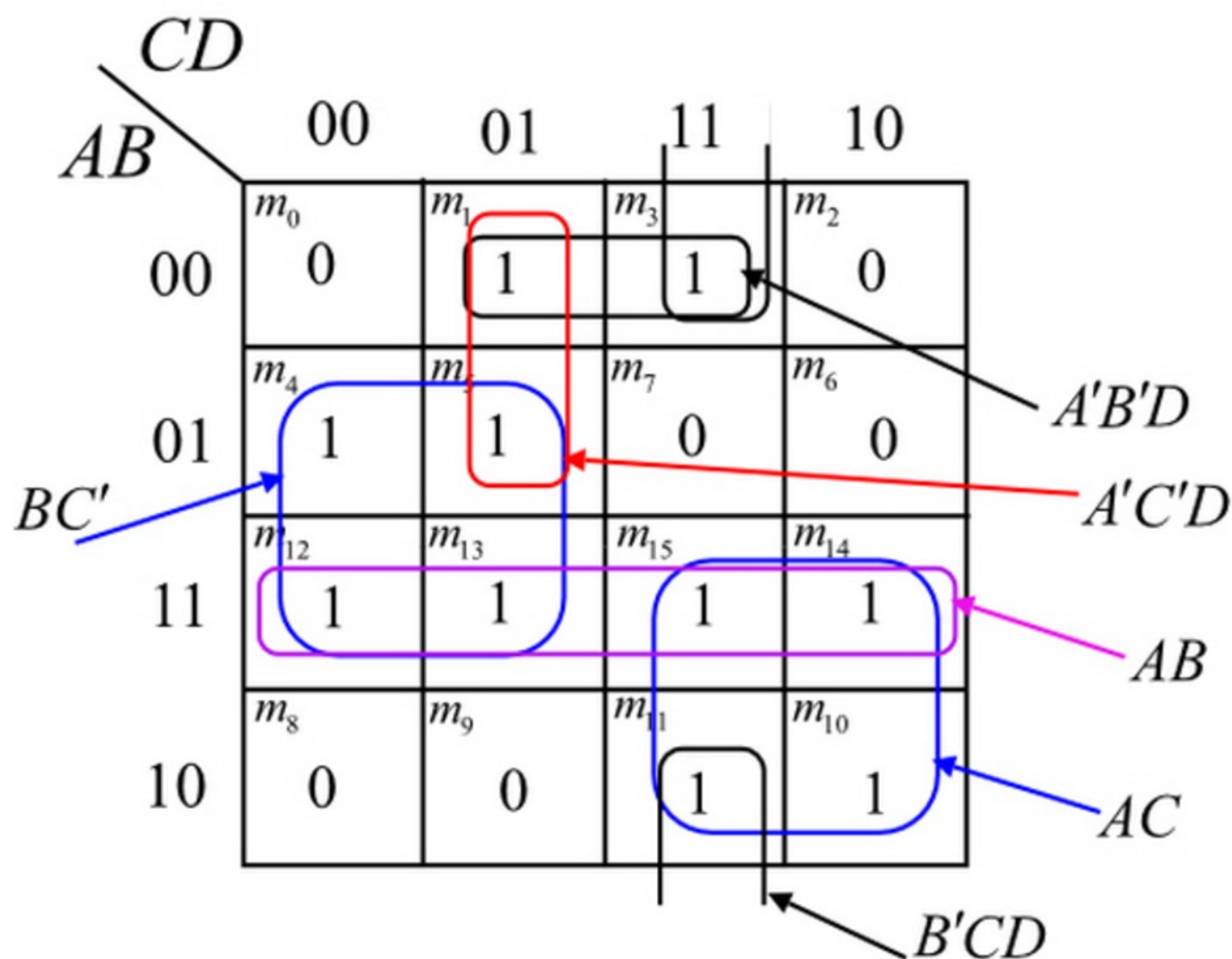
3.10 (b)



Prime Implicants: $CD, A'BD, AC, B'D', B'C$

Essential Prime Implicants: $A'BD, AC, B'D'$

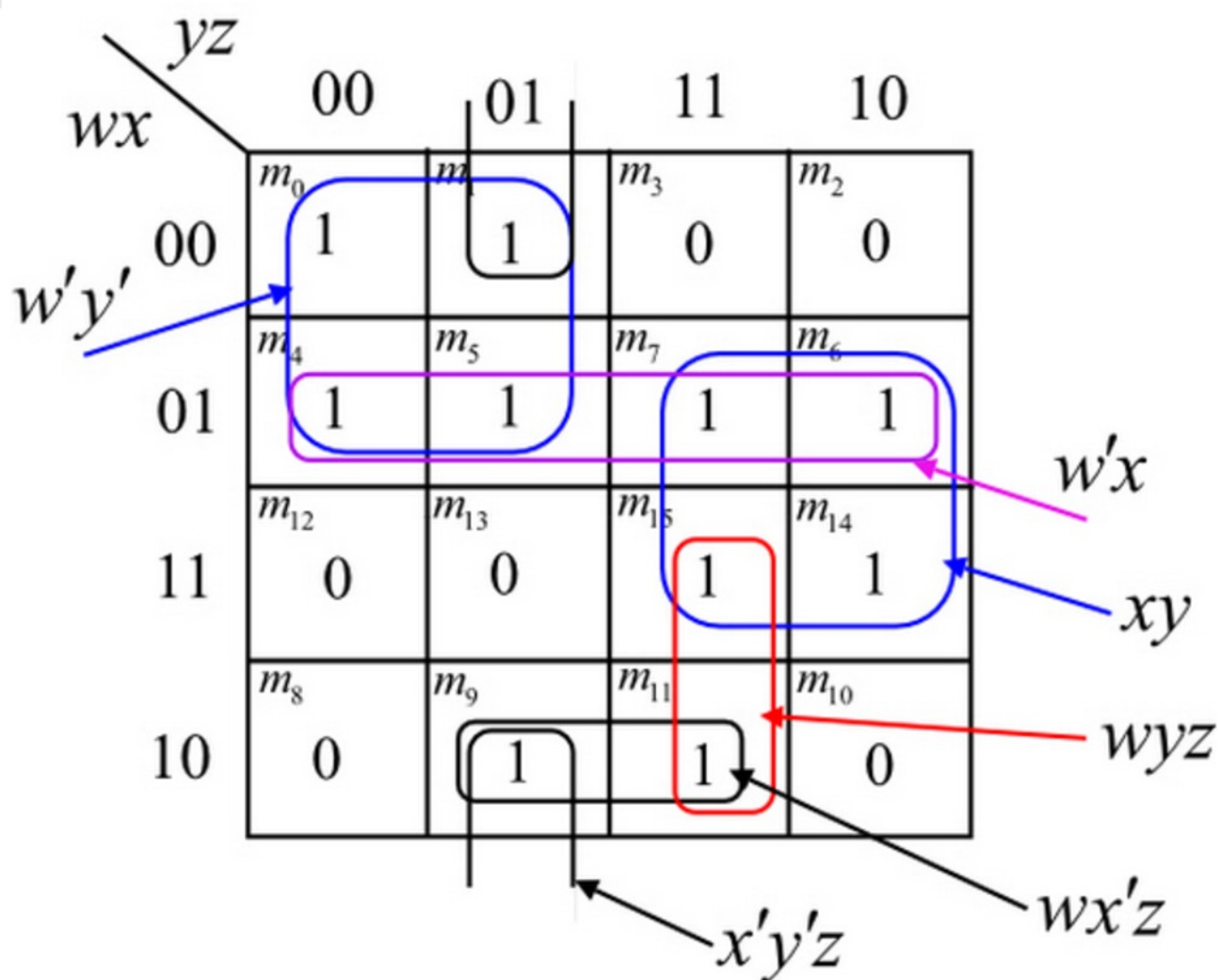
3.10 (C)



Prime Implicants: BC' , $B'CD$, AC , AB , $A'C'D$, $A'B'D$

Essential Prime Implicants: BC' , AC

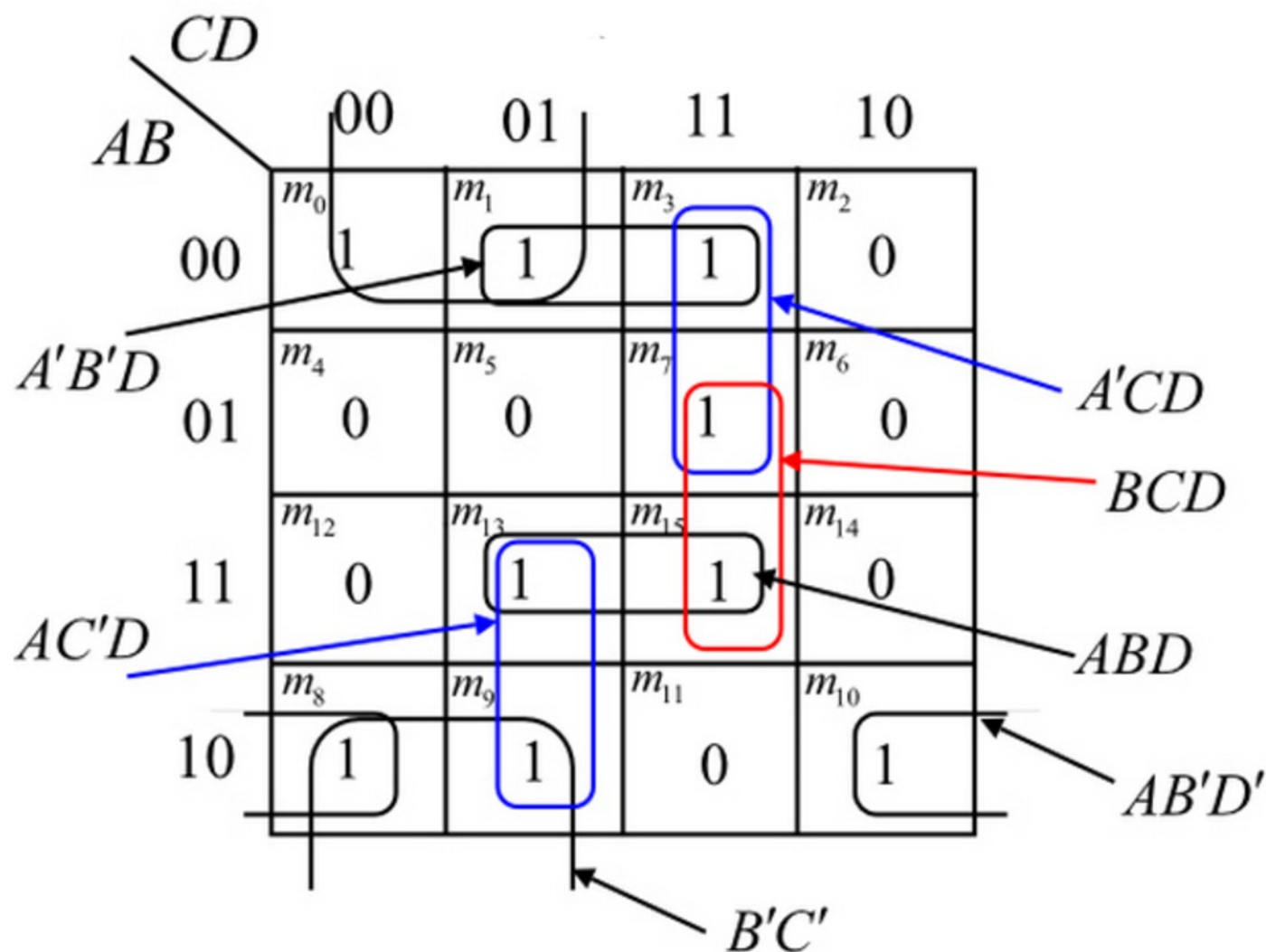
3.10 (d)



Prime Implicants: $w' y', x' y' z, w x' z, w y z, x y, w' x$

Essential prime implicants: $w' y', x y$

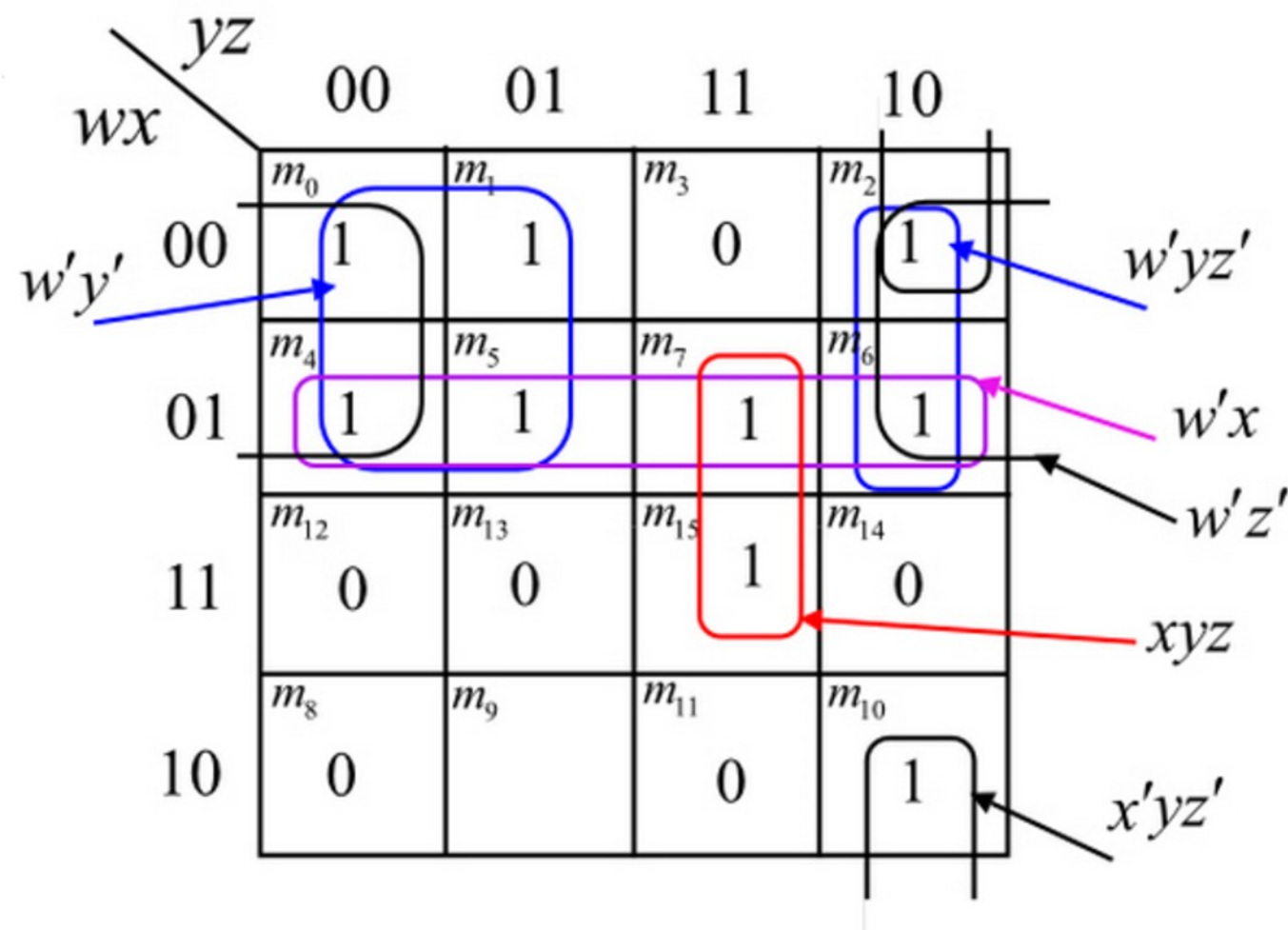
3.10 (e)



Prime implicants: $A'B'D$, $AC'D$, $B'C'$, $AB'D'$, ABD , BCD , $A'CD$

Essential Prime Implicants: $B'C'$, $AB'D'$

3.10 (f)



Prime Implicants: $w'y', x'yz', xyz, w'z', w'x, w'yz'$

Essential prime implicants: $w'y', x'yz', xyz$

3.15 (a)

yz					
		00	01	11	10
x	0	1	1	X	X
	1	1	1	X	1

$$F = \sum(0,1,2,3,4,5,6,7) = 1$$

3.15 (b)

<i>AB</i> \ <i>CD</i>	00	01	11	10
00	1	0	0	X
01	X	0	0	1
11	0	1	0	1
10	1	0	0	X

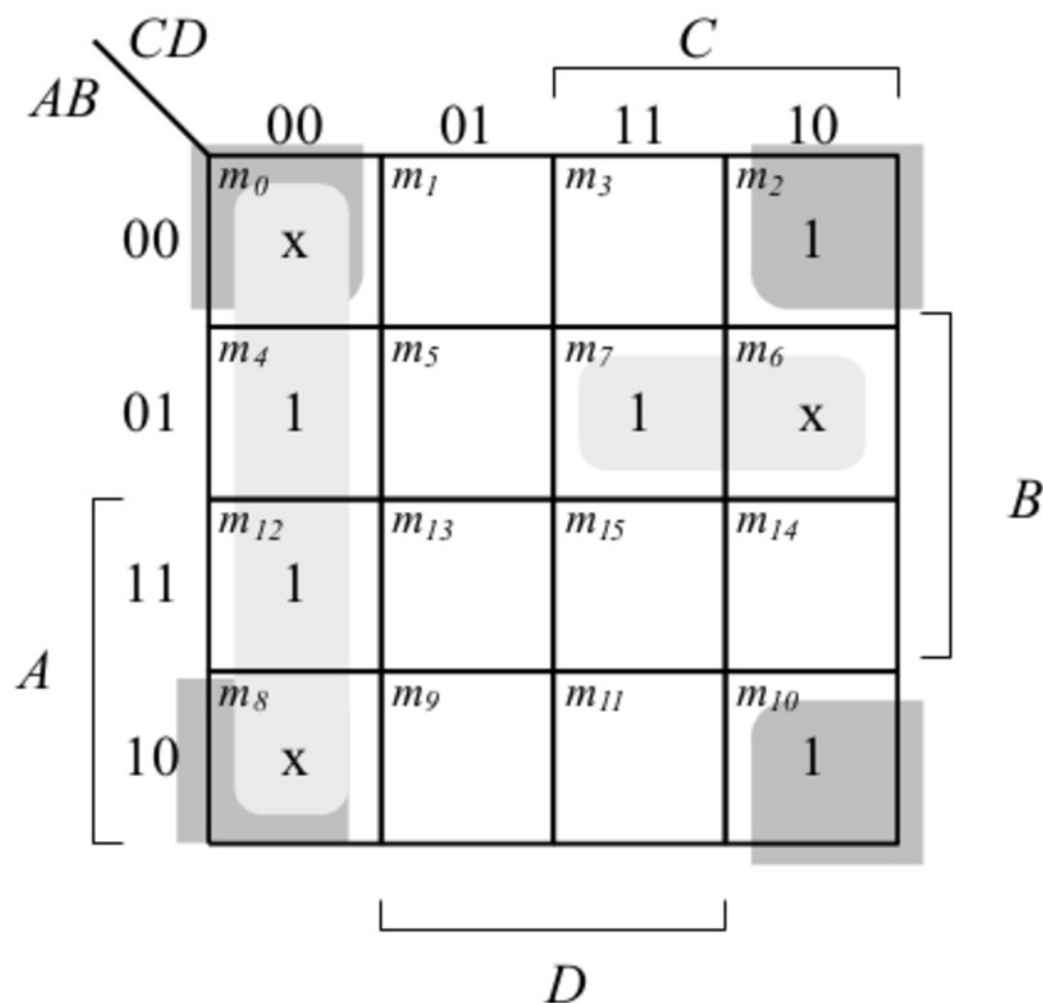
$$F = B'D' + CD' + ABC'D = \sum(0, 2, 6, 8, 10, 13, 14)$$

3.15 (c)

$AB \backslash CD$		CD			
		00	01	11	10
00	0	0	0	X	0
01	0	0	1	1	1
11	1	0	0	1	1
10	0	0	X	X	0

$$F = ABD' + A'BD + BC = \sum(5, 6, 7, 12, 14, 15)$$

3.15 (d)

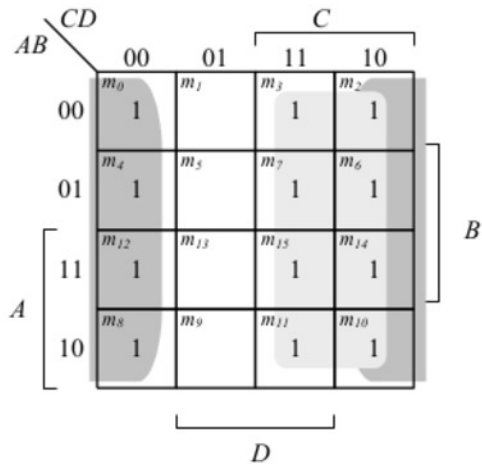


$$F = B'D' + C'D' + A'BC$$

$$F = \Sigma(0, 2, 4, 6, 7, 8, 10, 12)$$

3.16

(a)

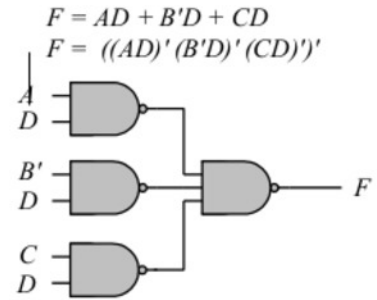
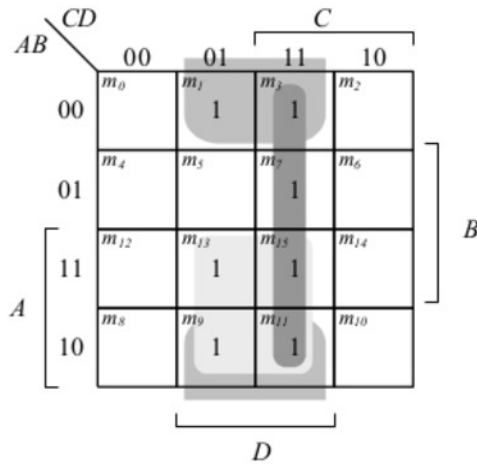


$$F = C + D'$$

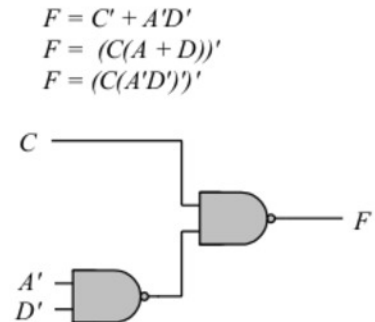
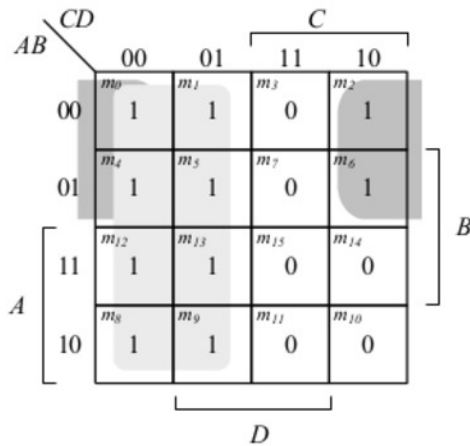
$$F = (C'D)'$$



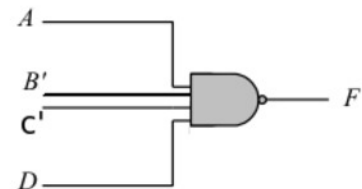
3.16 (b)



(c) $F = (A' + C' + D')(A' + C')(C' + D')$
 $F' = (A' + C' + D')' + (A' + C')' + (C' + D')'$
 $F' = ACD + AC + CD$



(d) $F(A,B,C,D) = A' + B + D' + B'C$
 $\Rightarrow F' = (A' + B + D' + B'C)'$
 $\quad = AB'D(B + C')$
 $\quad = AB'DB + AB'DC'$
 $\quad = 0 + AB'DC'$
 Therefore, $F = (AB'DC')'$



3.18

$$F = (A \oplus B)'(C \oplus D) = (AB' + A'B)'(CD' + C'D)$$

$$= (AB + A'B')(CD' + C'D) = ABCD' + ABC'D + A'B'CD' + A'B'C'D$$

$$F' = (AB + A'B')' + (CD' + C'D)'$$

$$F' = ((A' + B')' + (A + B)')' + ((C' + D)' + (C + D')')'$$

$$F = (((A' + B')' + (A + B)')' + ((C' + D)' + (C + D')')')'$$

