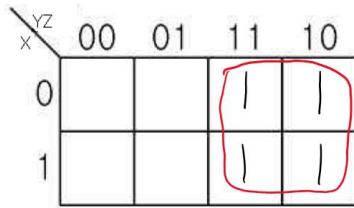
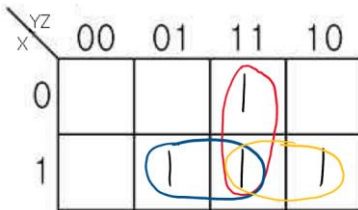


1. 다음 불 식을 3변수 카르노 맵을 이용하여 간소화하여라.

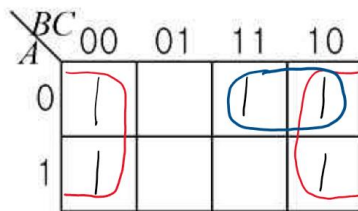
①  $F(X,Y,Z) = \sum m(2,3,6,7) = Y$



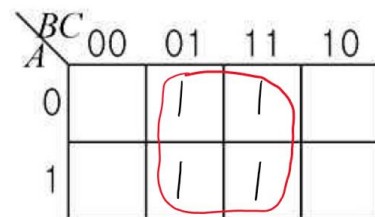
②  $F(X,Y,Z) = \sum m(3,5,6,7) = XY + YZ + ZX$



③  $F(A,B,C) = \sum m(0,2,3,4,6) = \overline{B} + \overline{C}$



④  $F(A,B,C) = \sum m(1,3,5,7) = C$



⑤  $F(X,Y,Z) = XY + \overline{Y} + \overline{\overline{X}} = XY + \overline{\overline{X}}$

$$\begin{aligned}
 & XY + Y\bar{Z} + \bar{X}\bar{Y}\bar{Z} \\
 &= XY(\bar{Z} + Z) + (X + \bar{X})Y\bar{Z} + \bar{X}\bar{Y}\bar{Z} \\
 &= XY\bar{Z} + XYZ + X\bar{Y}\bar{Z} + \bar{X}Y\bar{Z} + \bar{X}\bar{Y}\bar{Z} \\
 &= XY\bar{Z} + X\bar{Y}\bar{Z} + \bar{X}Y\bar{Z} + \bar{X}\bar{Y}\bar{Z} \\
 &= \sum m(0, 2, 6, 7)
 \end{aligned}$$

$\backslash YZ$	00	01	11	10
X				
0	1			1
1			1	1

⑥  $F(A, B, C) = \bar{A}\bar{B}\bar{C} + BC + \bar{A}\bar{B} = \bar{A}\bar{B} + BC$

$$\begin{aligned}
 & \bar{A}\bar{B} + BC + \bar{A}B\bar{C} \\
 &= \bar{A}\bar{B}(C + \bar{C}) + (A + \bar{A})BC + \bar{A}B\bar{C} \\
 &= \bar{A}\bar{B}C + \bar{A}\bar{B}\bar{C} + ABC + \bar{A}B\bar{C} + \bar{A}B\bar{C} \\
 &= \sum m(0, 1, 2, 3, 7)
 \end{aligned}$$

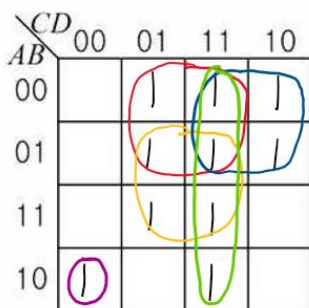
$\backslash BC$	00	01	11	10
A				
0	1	1	1	1
1			1	

2. 다음 4변수 카르노 맵을 이용하여 간소화하여라.

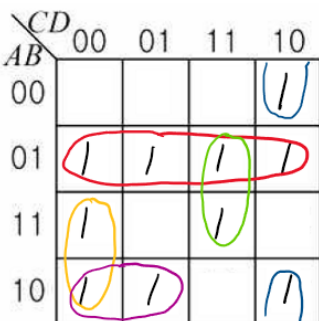
①  $F(A, B, C, D) = \sum m(0, 2, 4, 5, 6, 7, 8, 10, 13, 15) = \bar{B} + BD + \bar{A}\bar{C}$

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

$$\textcircled{2} \quad F(A,B,C,D) = \sum m(1,2,3,5,6,7,8,11,13,15) = \overline{C} + \overline{D} + BD + CD + \overline{A}$$

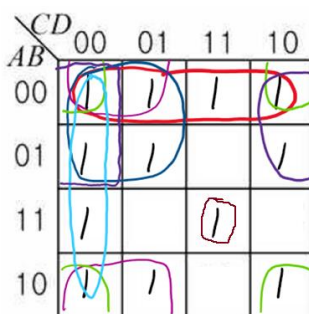


$$\textcircled{3} \quad F(A,B,C,D) = \sum m(2,4,5,6,7,8,9,10,12,15) = \overline{B} + \overline{C} + \overline{A} + BD + \overline{A}D$$



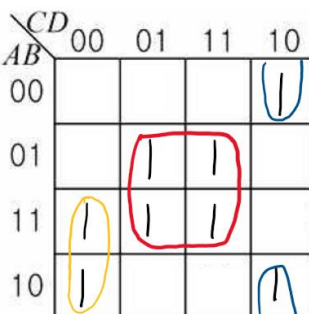
$$\textcircled{4} \quad F(A,B,C,D) = \sum m(0,1,2,3,4,5,6,8,9,10,12,15)$$

$$= \overline{A} + \overline{B} + \overline{C} + \overline{D} + \overline{A}B + ABD$$

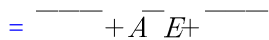


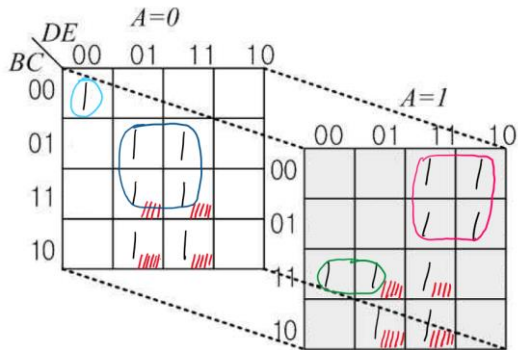
$$\textcircled{5} \quad F(A,B,C,D) = \sum m(2,5,7,8,10,12,13,15)$$

$$= \overline{A} + BD + \overline{C}$$



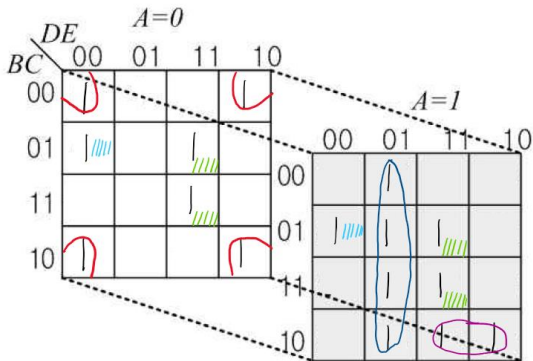
$$= \overline{AB} + \overline{BC} + \overline{CD} + \overline{AD} + A + BD$$





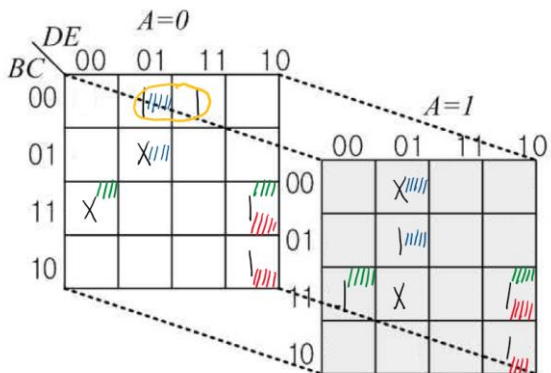
$$\textcircled{4} F(A,B,C,D,E) = \sum m(0,2,4,7,8,10,15,17,20,21,23,25,\underline{26},27,29,31)$$

$$= \overline{\phantom{A}} + \overline{A} \overline{E} + \overline{CE} + \overline{AB} \overline{D} + \overline{\phantom{C}}$$



$$\textcircled{5} F(A,B,C,D,E) = \sum m(1,3,10,14,21,26,28,30) + \sum d(5,12,17,29)$$

$$= \overline{\phantom{A}} E + \overline{BD} + \overline{BC} + \overline{\phantom{C}} E$$



$$\textcircled{6} F(A,B,C,D,E) = \sum m(0,1,2,4,5,6,10,13,14,18,21,22,24,26,29,30)$$

$$= \overline{D} + \overline{\phantom{A}} + \overline{C} E + \overline{AB}$$

