

1.

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

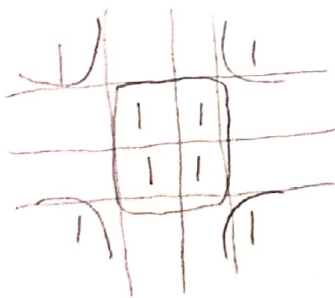
1) canonical SOP form

$$\begin{aligned} F = BD + B'D' &= (A+A')(C+C')BD + (A+A')(C+C')B'D' \\ &= ABCD + ABC'D + A'BCD + A'BC'D + AB'C'D + AB'C'D' + A'B'C'D + A'B'C'D' \\ &= m_{15} + m_{13} + m_7 + m_5 + m_{14} + m_8 + m_2 + m_0 \\ &= \sum m(0, 2, 5, 7, 8, 10, 13, 15) \end{aligned}$$

2) Karnaugh Map

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

3) Find simplest SOP form using Karnaugh map.



① 11를 찾는다 $BD, B'D'$

② 01을 찾는다 $BD, B'D'$

BD 와 $B'D'$ 은 모두 중복되지. ^{않은} simplest SOP form은 $BD + B'D'$ 이다.

복합은 포함하고. ^인 $B'D'$

2.

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

1) Canonical POS form

$$\begin{aligned} F &= (A+C)(B'+C'+D')(B+C'+D) = (A+B\cdot B'+C+D\cdot D')(A\cdot A'+B'+C'+D')(A\cdot A'+B+C'+D) \\ &= (A+B+C+D\cdot D')(A+B'+C+D\cdot D')(A+B'+C'+D')(A'+B'+C'+D')(A+B+C'+D)(A'+B+C'+D) \\ &= (A+B+C+D)(A+B+C+D')(A+B'+C+D)(A+B'+C+D')(A+B'+C'+D')(A'+B'+C'+D')(A+B+C'+D)(A'+B+C'+D) \\ &= M_0 \cdot M_1 \cdot M_4 \cdot M_5 \cdot M_{11} \cdot M_{15} \cdot M_2 \cdot M_{10} \\ &= \prod M(0, 1, 2, 4, 5, 11, 10, 15) \end{aligned}$$

2) Karnaugh map

$\begin{array}{c} \text{CD} \\ \text{AB} \end{array}$	00	01	11	10
00	0	0	1	0
01	0	0	0	1
11	1	1	0	1
10	1	1	1	0

3) Find simplest POS form using Karnaugh map

① PI를 찾는다 $(A+C), (B'+C'+D'), (B+C'+D)$ ② EPI를 찾는다 $(A+C), (B'+C'+D'), (B+C'+D)$ $(A+C)$ 과 $(B'+C'+D')$ 과 $(B+C'+D)$ 는 모두 중복되지 않는 부분을포함하고 있으므로 simplest POS form은 $(A+C)(B+C'+D)(B'+C'+D')$ 이다.