

## K-Map (Don't Care Condition)

Q

①  $f(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 12, 13, 14)$   
 $+ \sum d(1, 4, 11, 15)$

SOP

↑  
don't care cond<sup>n</sup>.

		$CD \rightarrow$			
		$C'D'$ 00	$C'D$ 01	$CD$ 11	$CD'$ 10
$AB \downarrow$		0	1	3	2
$A'B'$	00	1	X	1	1
$A'B$	01	4	5	7	6
		X	0	1	1
$AB$	11	12	13	15	14
		1	1	X	1
$AB'$	10	8	9	11	10
		0		X	0

$$f = A'B' + CA' + AB$$

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7	8	9	10	11
14	15	16	17	18
21	22	23	24	25
28	29	30	31	

$$\textcircled{2} f(A, B, C, D) = \pi M(5, 8, 9, 10) \pi D(1, 4, 11, 15)$$

CD

AB

6	1	3	2
4	5	7	6
12	13	15	14
8	9	11	10

Diagram description: A 4x4 Karnaugh map for variables A, B, C, and D. The map is labeled with 'AB' on the left and 'CD' at the top. The cells are numbered 0 through 15. The map shows two prime implicants circled in green: a 2x2 square covering cells 0, 1, 4, and 5, and a horizontal row covering cells 8, 9, 11, and 10. The cells 1, 4, 11, and 15 contain an 'X', indicating they are part of the prime implicants. The cells 0, 5, 8, 9, and 10 contain a '0', indicating they are not part of the prime implicants.

$$f = (A + C)(A' + B)$$

Questions

① Reduce using mapping the expression

$$f = \sum m(2, 3, 6, 7, 8, 10, 11, 13, 14)$$

② Reduce the following expression to the simplest possible POS & SOP forms

$$f = \sum m(6, 9, 13, 18, 19, 25, 27, 29, 31)$$

$$+ d(2, 3, 11, 15, 17, 24, 28)$$