Lecture 5

K-map with don`t-care conditions

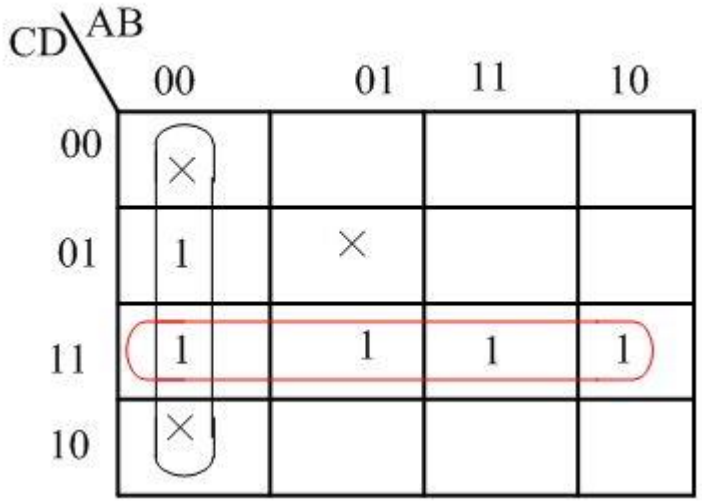
k-map with don`t-care conditions:

- While grouping the minterms, assume don`t care as 1. After all the minterms has been covered, if any don`t care term is left that can be neglected.

Ex1: Simplify the following Boolean function using k-map

$$f(A,B,C,D) = \sum m(1,3,7,11,15) + \sum d(0,2,5)$$

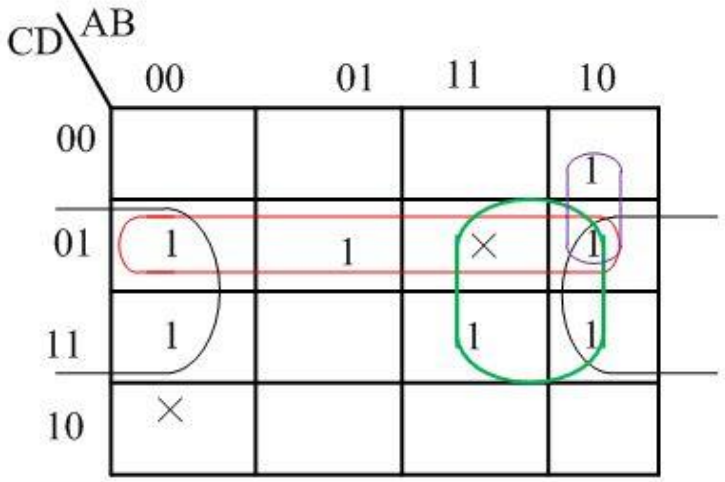
Sol:



$$\therefore f(A,B,C,D) = \overline{A}\,\overline{B} + CD$$

Ex2 : Simplify the following Boolean function using k-map

$$f(A,B,C,D)=\sum m(1,3,5,8,9,11,15)+\sum d(2,13)$$



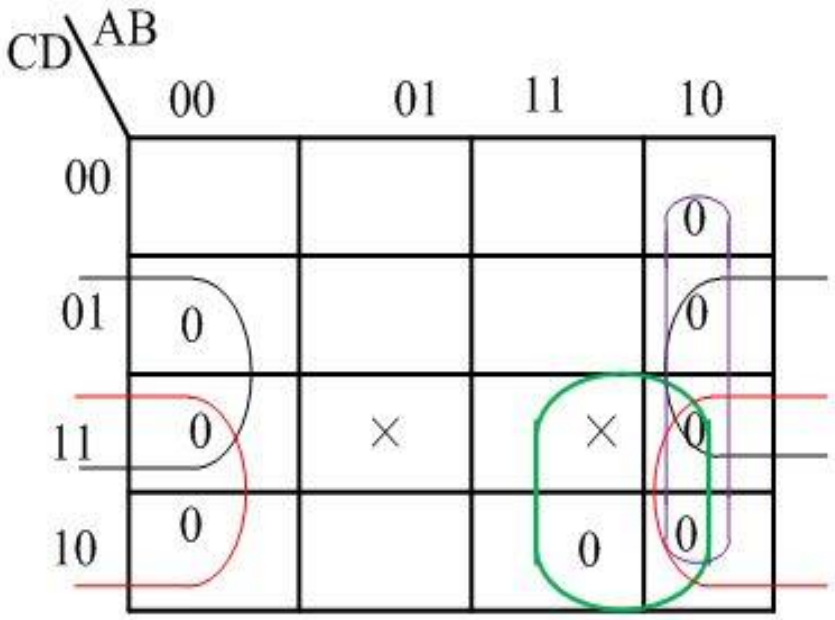
$$\therefore f(A,B,C,D)=\bar{C}D+\bar{B}D+AD+A\bar{B}\bar{C}$$

- While grouping the maxterms, assume don`t care as 0. After all the maxterms has been covered, if any don`t care term is left that can be neglected.

Ex3: Simplify the following Boolean function using k-map

$$f(A,B,C,D) = M(1,2,3,8,9,10,11,14) + \sum d(7,15)$$

Sol:



$$\therefore f(A,B,C,D) = (\overline{A}+B)(B+\overline{D})(B+\overline{C})(\overline{A}+\overline{C})$$