

Tutorial 2(Extra Questions)

(1). Simplify Boolean expression $A+A'B+A'B'C+A'B'C'D+ \dots$

sol: $A+B+C+D+\dots$

(2). $Y = F(A,B,C,D) = \sum (0,1,4,5,7,9,12)$. Express the same using Π ?

sol: $Y = F(A,B,C,D) = \Pi(2,3,6,8,10,11,13,14,15)$

(3). 14. $Y = A'C + AC'B'$ and you are given that $A=C=1$ will never occur. Simplify Y?

Sol: $Y = A'C + AC'B'$ and the output will be don't care for $A = C = 1$. So the K-map will be as follows:

		BC			
		00	01	11	10
A	0		1	1	
	1	1	X	X	

Thus the simplified expression for Y is $AB' + C$

(4). If $F(A,B,C,D,E) = B'E$, how many terms will be there in the standard or canonical SOP representation of F?

Sol: 8 terms, $F = B'E (A + A') (C + C') (D + D')$
 $= (B'E A + B'E A') (C + C') (D + D')$
 $= (B'E A C + B'E A C' + B'E A' C + B'E A' C') (D + D')$
 $= B'E A C D + B'E A C' D + B'E A' C D + B'E A' C' D +$
 $B'E A C D' + B'E A C' D' + B'E A' C D' + B'E A' C' D'$

(5). In a 4 variable K-map, how many literals will the grouping of 4 adjacent cells will result. Generalize the solution for N variable k-map and for grouping of K adjacent cells?

Sol: In 3 variable map, grouping all 8 cells will give zero literals in the term as it is logical 1 always. Similarly, in 4 variable map the same grouping will give 1 literals, in 5 a variable map it is 2 and so on..

- So the literals in the term = $N - \log_2 k$

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6.If a variable is having EX-OR operation itself 'n' number of times then the result is?

sol:Let the variable be A

If 'n' is odd: The result would be 'A'

If 'n' is even: The result would be '0'