



Digital design(A)

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Steps :

1- Draw a table which contains 3 icons:

-Groups: *here we will divide our truth table into groups according to number of 1s.*

-Minterm: *contains minterms of each group.*

-Binary representation : *here we will represent each minterm according to it's binary representation.*

2- Make a new table which contains 3 icons :

-Groups.

-Matched pairs : *contains pairs of minterms which are matched in all their bits except in one bit.*

-Binary representation.

3- Repeat the past step until you never find any matched pairs again.

Step :- 2

Group	Matched pairs	Bin. Rep.			
		A	B	C	D
0	$m_0 - m_1$	0	0	0	-
	$m_0 - m_8$	-	0	0	0
1	$m_1 - m_3$	0	0	-	1
	$m_1 - m_9$	-	0	0	1
	$m_8 - m_9$	1	0	0	-
2	$m_3 - m_7$	0	-	1	1
	$m_3 - m_{11}$	-	0	1	1
	$m_9 - m_{11}$	1	0	-	1
3	$m_7 - m_{15}$	-	1	1	1
	$m_{11} - m_{15}$	1	-	1	1

4- Make a new table which named as prime implicant and get the essential primes from it then write your function expression.

$$Y = \bar{B}\bar{C} + CD$$

P.I.	Minterms involved	0	1	3	7	8	9	11	15
$\bar{B}\bar{C}$	0, 1, 8, 9	⊗	x			⊗	x		
$\bar{B}D$	1, 3, 9, 11		x	x			x	x	
CD	3, 7, 11, 15			x	⊗			x	⊗