

SNS COLLEGE OF TECHNOLOGY



Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECB231 - DIGITAL ELECTRONICS

II YEAR/ III SEMESTER

UNIT 1 – MINIMIZATION TECHNIQUES AND LOGIC GATES

TOPIC - QUINE- MC CLUSKEY METHOD OF MINIMIZATION





>k map is difficult to simplify the Boolean functions having more than 5 variables.

Quine-Mc Cluskey tabular method is a tabular method based on the concept of prime implicants.





Prime Implicants(PI)

➤ Group of minterms which cannot be combined with any other minterms or groups.

Essential Prime implicants (EPI)

- The essential prime implicant is a prime implicant in which one or more minterm are unique.
- Contains atleast one minterm which is not contained in any other.



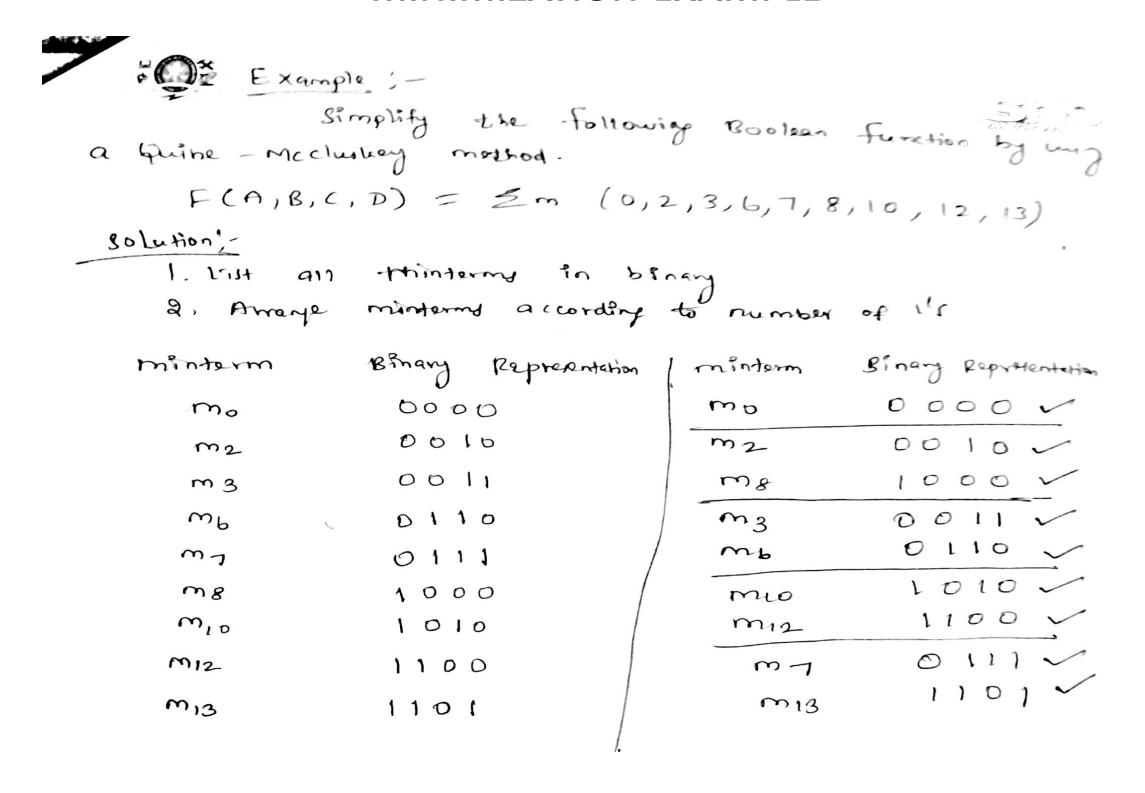


PROCEDURE:

- 1.List all minterms in the binary form.
- 2.Arrange all the minterms accordingly to number of one's contained and from the groups having no one's, one 1's, two 1's, three 1's and so on.
- 3.Compare each binary numbers with every group in the adjacent next higher category group and they differ only one bit position.
- 4.Apply the same process described in step 3 for the resultant coulmn and continue the cycles until a single pass through cycle yields further elimination of literals.
- 5.List all prime Implicants.
- 6.Select the minimum number of prime implicants which must cover all the minterms.











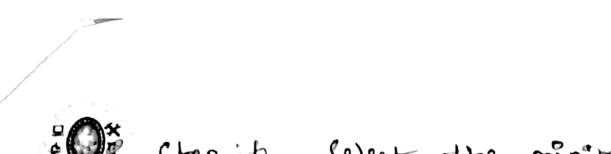
GARD Step	2 & 4. Lorumn (c)	Column(P)
milhtorm		minterny & Binay Represe
0,2	00_0	0,2,8,10 -0-0
018	-000 V	2,3,6,7 0_1_
2,3	001-	
2,6	0-10	
2,10	-010	
8,10	10-0	
8,12	1-00	
3,7	0-11	
6,7	011-	
12,13	110-	





Step 5 L95+	the prime	Implitants.
prime I		Binary Representation
ACD	8,12	- 00
ABC	12,13	1 10 _
BD	0,2,8,10	_ 0 _ 0
FC /	2,3,6,7	0 - 1-







prime implicants which must cover all the minterny

Prime Implicants		mo	m2 ·	m ₃	mb	ma	ണ്യ	mio	mız	m ₁₃
ACD	8,12						\odot		0	
ABC	12,13								0	0
BD.	0,2,8,1	9 0					O)	
AC	2,3,6,		\odot	0						

$$f(A,B,C,D) = [110-) + (-0-0) + (0-1-)$$

= ABT + B D + TC.



APPLICATIONS



- It is more efficient for use in computer algorithms
- It also gives a deterministic way to check that the minimal form of a boolean function has been reached



ASSESSMENTS



- 1. What is the another name for Quine Mc Cluskey method?
- 2. The starting point of the tabulation method that specifies the function is the----
- 3. Unchecked terms in the table forms are-----
- 4. What is the first tabulation method?
- 5. State Prime Implicants.





THANK YOU