



FACULTY OF ENGINEERING & TECHNOLOGY

Dileep Kumar
Assistant Prof. EE Deptt

LOGIC GATE

Three Variable K – map:

For three variables two adjacent variables are taken on either side (vertical line or horizontal line) of the K – map and the remaining one variable on the other side. Let A, B and C are the three variables.

		$A \cdot B$			
		00	01	11	10
C	0	m_0	m_2	m_6	m_4
	1	m_1	m_3	m_7	m_5



		C	
		0	1
$A \cdot B$	00	m_0	m_1
	01	m_2	m_3
	11	m_6	m_7
	10	m_4	m_5

NUMBER SYSTEM

Four Variable K – map:

For four variables two adjacent variables are taken on either side (vertical line or horizontal line) of the K– map and the two variables on the other side. Let A, B, C and D are the four variables.

<i>C.D</i> \ <i>A.B</i>		<i>A.B</i>			
		00	01	11	10
<i>C.D</i>	00	m_0	m_4	m_{12}	m_8
	01	m_1	m_5	m_{13}	m_9
	11	m_3	m_7	m_{15}	m_{11}
	10	m_2	m_6	m_{14}	m_{10}

OR

<i>A.B</i> \ <i>C.D</i>		<i>C.D</i>			
		00	01	11	10
<i>A.B</i>	00	m_0	m_1	m_3	m_2
	01	m_4	m_5	m_7	m_6
	11	m_{12}	m_{13}	m_{15}	m_{14}
	10	m_8	m_9	m_{11}	m_{10}

NUMBER SYSTEM

Example 1: Draw the K – maps for the following Boolean function of three variables.

$$F_1(A, B, C) = \sum (m_1, m_3, m_5, m_6, m_7)$$

In the K – map of three variables 1s entry are made for the combinations m_1, m_3, m_5, m_6, m_7 and in the remaining combinations, 0s are entered.

		A · B			
		00	01	11	10
C	0	0	0	1	0
	1	1	1	1	1



Example 2: Draw the K – maps for the following Boolean function of four variables.

$$F_1(A, B, C, D) = \sum (m_2, m_3, m_4, m_6, m_7, m_{11}, m_{14}, m_{15})$$

		A · B			
		00	01	11	10
C · D	00	0	1	0	0
	01	0	0	0	0
	11	1	1	1	1
	10	1	1	1	0