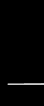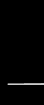# Switching Circuit & Logic Design

Lecture 10 : Karnaugh Map for three variables

Max and minterms for three variables
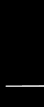
Maxterm	Minterm	A	B	C
$M_0 = A+B+C$	$m_0 = A'B'C'$	0	0	0
$M_1 = A+B+C'$	$m_1 = A'B'C$	0	0	1
$M_2 = A+B'+C$	$m_2 = A'BC'$	0	1	0
$M_3 = A+B'+C'$	$m_3 = A'BC$	0	1	1
$M_4 = A'+B+C$	$m_4 = AB'C'$	1	0	0
$M_5 = A'+B+C'$	$m_5 = AB'C$	1	0	1
$M_6 = A'+B'+C$	$m_6 = ABC'$	1	1	0
$M_7 = A'+B'+C'$	$m_7 = ABC$	1	1	1

Karnaugh Map For Three Variables

A\BC	00	01	11	10
0	m_0	m_1	m_3	m_2
1	m_4	m_5	m_7	m_6

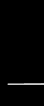| A\BC	00	01	11	10
0	M_0	M_1	M_3	M_2
1	M_4	M_5	M_7	M_6

Practice

$$F = A'B'C + AB'C + A'BC' + ABC' + ABC$$
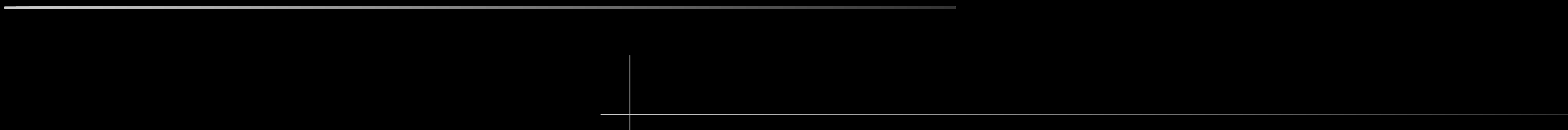
Practice

F = (A+B+C) (A'+B+C') (A'+B'+C') (A+B'+C') (A'+B'+C)

Reduce

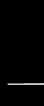| A\BC	00	01	11	10
0				
1				

Reduce

$$F = \sum_m (0,2,3,4,5,6)$$

Reduce

$$F = \prod_M (0,1,2,3,4,7)$$

Design the following logic circuit

F = A.B.C.D.E → With NOR

Design the following logic circuit

F = ab' + a'b → With NAND