

Q.1.7 Theoretical Calculation

						\oplus XOR
A	B	C	01	02	$f = 01 \oplus 02$	
0	0	0	0 } c	0 } c	0	
0	0	1	1 } c	1 } c	0	
0	1	0	1 } c'	0 } c	(1)	
0	1	1	0 } c'	1 } c	(1)	
1	0	0	0 } c	0 } c	0	
1	0	1	0 } c	1 } c	(1)	
1	1	0	1 } c'	1 } c'	0	
1	1	1	1 } c'	0 } c'	(1)	

Result \uparrow

$$F(A, B, C) = \sum m(2, 3, 5, 7)$$

		BC		BC		BC		BC	
A	B	C	00	01	11	10	A	B	C
0	0	0	0	1	1	2	0	0	0
0	0	1	1	0	0	3	0	0	1
0	1	0	0	1	0	4	0	1	0
0	1	1	1	0	1	5	0	1	1
1	0	0	0	1	0	6	1	0	0
1	0	1	1	0	1	7	1	0	1
1	1	0	0	1	0	2	1	1	0
1	1	1	1	0	1	3	1	1	1

$$f = \bar{A}B + AC$$

(Minimized Expression using k-map)

	CD	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
AB	00	01	11	10	
$\bar{A}\bar{B}$	00	0	1	3	2
$\bar{A}B$	01	4	5	7	6
AB	11	12	13	15	14
$A\bar{B}$	10	8	9	11	10

$$W = A + BC + BD$$

$$X = B\bar{C}\bar{D} + \bar{B}D + \bar{B}C$$

	CD	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
AB	00	01	11	10	
$\bar{A}\bar{B}$	00	1	3	2	
$\bar{A}B$	01	4	5	7	6
AB	11	12	13	15	14
$A\bar{B}$	10	8	9	11	10

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

	CD	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
AB	00	01	11	10	
$\bar{A}\bar{B}$	00	1	3	2	
$\bar{A}B$	01	4	5	7	6
AB	11	12	13	15	14
$A\bar{B}$	10	8	9	11	10

$$Z = \bar{D}$$