2.1

(1)$A \oplus 0 = A$

A	$A \oplus 0$
0	0
1	1

(4)$A \oplus A' = 1$

A	$A \oplus A'$
0	1
1	1

(7)$A \oplus B' = (A \oplus B)' = A \oplus B \oplus 1$

A	B	$A \oplus B'$	$(A \oplus B)'$	$A \oplus B \oplus 1$
0	0	1	1	1
0	1	0	0	0
1	0	0	0	0
1	1	1	1	1

2.3

$$Y_1 = \overline{ABC} + \overline{AB}C + A\overline{BC} + A\overline{B}C + ABC$$

$$Y_2 = \overline{ABC}D + \overline{AB}C\overline{D} + \overline{A}B\overline{CD} + \overline{A}BCD + A\overline{BCD} + A\overline{B}CD + AB\overline{C}D + ABC\overline{D}$$

2.5

(1)

A	B	C	D	Y_1
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

(2)

A	B	C	D	Y_2
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

2.7

(a)

$$Y_1 = \overline{\overline{A + \overline{B}C}} \oplus \overline{\overline{C}D}$$

(b)

$$Y_2 = \overline{\overline{A\overline{B}E} + \overline{\overline{B}CDE}}$$

2.8

C	B	A	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

$Y = AB\overline{C} + A\overline{B}C + \overline{A}BC$

2.10

(1)$Y = \sum m(1,3,5,7)$

(4)$Y = \sum m(3,6,7,11,12,13,14,15)$

(6)$Y = \sum m(1,2,4,5,6,7,8,9,10,11,13,14)$

2.11

(2)$Y = \prod m(0,2,6)$

(5)$Y = \prod m(0,3,5)$

2.12

(3)$AB' + AC + BC = AB' + ABC + AB'C + BC = AB' + BC$

(6)$ABD + AB'CD' + AC'DE + A = A$

2.13

(2)$Y = AB'C + A' + B + C' = \sum m(0,1,2,3,4,5,6,7) = 1$

(9)
$Y = BC' + ABC'E + B'(A'D' + AD)' + B(AD' + A'D) = BC' + B'(A \odot D)' + B(A \oplus D) = BC'$