

邏輯設計 CH4

4.6

見 P85

$$(a) F = \sum m(0, 6, 7) + \sum d(1, 5)$$

$$= A'B'C' + ABC' + ABC + A'B'C + \cancel{AB'C}$$

$$= A'B'(C'+C) + AB(C'+C)$$

$$= A'B' + AB \#$$

$$(b) G = \sum m(1, 3, 5, 7) + \sum d(2, 6)$$

$$= A'B'C + A'BC + AB'C + ABC + \cancel{A'BC} + \cancel{ABC}$$

$$= A'C(B'+B) + AC(B'+B)$$

$$= A'C + AC = C \#$$

4.13

A	B	C	D	Z
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
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	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1

$$f = \sum (0, 1, 7, 8, 14, 15)$$

$$= A'B'C'D' + A'B'C'D + A'BCD + A'BCD' + ABCD' + ABCD$$

$$= A'B'C'(D'+D) + \overbrace{ABC(D'+D)}^{BCD} + A'BCD + A'BCD'$$

$$= B'C'(A'+A'D) + \overbrace{BC(A'+A'D)}^{B'C'D'} + BCD + B'CD'$$

$$= A'B'C' + ABC + BCD + B'C'D' \#$$

4.15

	A	B	C	D	f	
0	0	0	0	0	X	0
	0	0	0	1	0	1
1	0	0	1	0	1	2
	0	0	1	1	X	3
2	0	1	0	0	1	4
	0	1	0	1	X	5
3	0	1	1	0	X	6
	0	1	1	1	1	7
4	1	0	0	0	0	8
	1	0	0	1	X	9
5	1	0	1	0	X	10
	1	0	1	1	1	11
6	1	1	0	0	X	12
	1	1	0	1	0	13
7	1	1	1	0	1	14
	1	1	1	1	X	15

$$(a) f = \sum m(2, 4, 7, 11, 14) + \sum d(0, 3, 5, 6, 9, 10, 12, 15)$$

$$(b) f = \Pi M(1, 8, 13) \cdot \Pi D(0, 3, 5, 6, 9, 10, 12, 15)$$

4.27

$$f(a, b, c) = a(b+c') = ab + ac' = ab(c+c') + ac'(b+b') = abc + abc' + abc' + ab'c' = abc + abc' + ab'c'$$

a	b	c	f
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	1
5	1	0	0
6	1	1	0
7	1	1	1

$$(a) f = \sum m(4, 6, 7)$$

$$(b) f = \Pi M(0, 1, 2, 3, 5)$$

$$(c) f' = \sum m(0, 1, 2, 3, 5)$$

$$(d) f' = \Pi M(4, 6, 7)$$

4.35

	A	B	C	D	X	Y	Z
0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	1
2	0	0	1	0	0	0	1
3	0	0	1	1	0	1	0
4	0	1	0	0	0	0	1
5	0	1	0	1	0	1	0
6	0	1	1	0	0	1	1
7	0	1	1	1	0	1	1
8	1	0	0	0	0	0	1
9	1	0	0	1	0	1	0
10	1	0	1	0	0	1	0
11	1	0	1	1	0	1	1
12	1	1	0	0	0	1	0
13	1	1	0	1	0	1	1
14	1	1	1	0	0	1	1
15	1	1	1	1	1	0	0

$$(a) X = \sum m(15) = m_{15}$$

$$Y = \sum m(3, 5, 6, 7, 9, 10, 11, 12, 13, 14)$$

$$Z = \sum m(1, 2, 4, 7, 8, 11, 13, 14)$$

$$(b) Y = \Pi M(0, 1, 2, 4, 8, 15)$$

$$Z = \Pi M(0, 3, 5, 6, 9, 10, 12, 15)$$