

$$\begin{array}{l}
 1-1. \\
 (3) 13.125_{10} \\
 1101.001_2 \\
 15.1_8 \\
 D.2_{16}
 \end{array}$$

$$\begin{array}{l}
 1-2. \\
 (3) 101.0011_2 \\
 5.1875_{10} \\
 5.14_8 \\
 5.3_{16}
 \end{array}$$

$$\begin{array}{l}
 1-3. \\
 (3) 61.53_8 \\
 49.671875_{10} \\
 110001.101011_2 \\
 31.AC_{16}
 \end{array}$$

$$\begin{array}{l}
 1-4. \\
 (3) D3.E_{16} \\
 211.875_{10} \\
 11010011.1110_2 \\
 323.7_{16}
 \end{array}$$

$$\begin{array}{l}
 1-7. \\
 (1) F_1 = A\bar{B}C + \bar{A}B\bar{C} \\
 \bar{F}_1 = (\bar{A} + B + \bar{C}) \cdot (A + \bar{B} + C)
 \end{array}$$

$$\begin{array}{l}
 (3) F_3 = (\bar{A} + B)(C + \bar{D}) \\
 \bar{F}_3 = A \cdot \bar{B} + \bar{C} \cdot D
 \end{array}$$

$$\begin{array}{l}
 1-8. \\
 (1) F_1 = A\bar{B} + \bar{C}D \\
 F'_1 = (A + \bar{B}) \cdot (\bar{C} + D)
 \end{array}$$

$$\begin{array}{l}
 (3) F_3 = \bar{A}(B + \bar{D}) + B(A + \bar{C}) \\
 F'_3 = (\bar{A} + B \cdot \bar{D}) \cdot (B + A \cdot \bar{C})
 \end{array}$$

1-9.

$$(3) F_3 = \bar{A}B + \bar{B}(C+AD)$$

真值表:

A	B	C	D	F	A	B	C	D	F
0	0	0	0	0	1	0	0	0	0
0	0	0	1	0	1	0	0	1	1
0	0	1	0	1	1	0	1	0	1
0	0	1	1	1	1	0	1	1	1
0	1	0	0	1	1	1	0	0	0
0	1	0	1	1	1	1	0	1	0
0	1	1	0	1	1	1	1	0	0
0	1	1	1	1	1	1	1	1	0

卡诺图:

AB \ CD	00	01	11	10
00	0	0	1	1
01	1	1	1	1
11	0	0	0	0
10	0	1	1	1

1-10.

A	B	C	D	F	A	B	C	D	F
0	0	0	0	0	0	0	0	0	1
0	0	0	1	1	1	0	0	1	0
0	0	1	0	1	1	0	1	0	1
0	0	1	1	0	1	0	1	1	0
0	1	0	0	1	1	1	0	0	0
0	1	0	1	0	1	1	0	1	0
0	1	1	0	0	1	1	1	0	1
0	1	1	1	1	1	1	1	1	0

解: 标准与或表达式:

$$F = \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D} + \bar{A}B\bar{C}\bar{D} + \bar{A}BCD + \bar{A}\bar{B}C\bar{D} + \bar{A}BC\bar{D}$$

标准或与表达式:

$$F = (A+B+C+D)(A+B+\bar{C}+\bar{D})(A+\bar{B}+C+\bar{D})(A+\bar{B}+\bar{C}+\bar{D})(\bar{A}+B+C+\bar{D})(\bar{A}+B+\bar{C}+\bar{D})(\bar{A}+\bar{B}+C+\bar{D})(\bar{A}+\bar{B}+\bar{C}+\bar{D})$$

1-11.

$$(3) F_3 = A\bar{B} + \bar{A}B\bar{C}$$

$$\text{解: } = A\bar{B} + \bar{A} \cdot \bar{B}C$$

$$= A\bar{B} + \bar{A} \cdot (\bar{B} + \bar{C})$$

$$= A\bar{B} + \bar{A}\bar{B} + \bar{A}\bar{C}$$

$$= A\bar{B}C + A\bar{B}\bar{C} + \bar{A}\bar{B}C$$

$$\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C$$

$$\text{即: } F_3 = \sum m(0, 1, 2, 4, 5)$$

$$(7) F_7(A, B, C) = \prod M(1, 3, 4, 7)$$

$$\text{解: } \underline{\underline{\bar{A} + \bar{B} + \bar{C} + \bar{D}}}$$

$$F_7 = \sum m(0, 2, 5, 6)$$

1-12.

$$(1) F_1 = A\bar{B} + B\bar{C} + C\bar{A}$$

$$\text{解: } F_1 = \sum m(1, 2, 3, 4, 5, 6)$$

$$F_1 = \prod M(0, 7)$$

$$(7) F_7(A, B, C) = \sum m(0, 1, 4, 6)$$

$$\text{解: } F_7 = \prod M(2, 3, 5, 7)$$

1-14.

(1) $A + \bar{A}B + BC\bar{D}$

解: $(A + \bar{A})(A + B) + BC\bar{D}$

$= A + B + BC\bar{D}$

$= A + B(1 + C\bar{D})$

$= A + B$

1-16

(1) $F_1(A, B, C, D) = \sum m(0, 1, 3, 4, 5, 9, 10, 14, 15)$

解:

AB\CD	00	01	11	10
00	1	1	1	0
01	1	1	0	0
11	0	0	1	1
10	0	1	0	1

$F_1(A, B, C, D) = \bar{A}\bar{C} + \bar{A}\bar{B}D + ABC + AC\bar{D} + \bar{B}\bar{C}D$

1-15

(5) $BCC\oplus D + A\bar{C}D + \bar{B}\bar{C}D + BC\bar{D}$

AB\CD	00	01	11	10
00	0	1	0	0
01	0	1	0	1
11	0	1	0	1
10	0	1	0	0

解: 原式 $= \bar{C}D + BC\bar{D}$

(5) $F_5(A, B, C, D) = \prod (1, 3, 7, 8, 9, 10, 14)$

解:

AB\CD	00	01	11	10
00	1	0	0	1
01	1	1	0	1
11	1	1	1	0
10	0	0	1	0

$F_5(A, B, C, D) = \bar{A}\bar{D} + \bar{B}\bar{C} + ACD$

(5) $F_5(A, B, C, D) = \prod M(1, 2, 5, 6, 7, 10, 13, 14)$

解:

AB\CD	00	01	11	10
00	1	0	1	0
01	1	0	0	0
11	1	0	1	0
10	1	1	1	0

$F_5 = (A + C + D)(\bar{B} + C + \bar{D})(A + \bar{B} + \bar{D})(\bar{C} + D)$

1-18.

(1) $F_1 = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}C\bar{D} + A\bar{B}\bar{C}\bar{D}$

约束条件: $AB + AC = 0$

解:

AB\CD	00	01	11	10
00	1			1
01				
11	x	x	x	x
10	1		x	x

$F_1 = \bar{B}\bar{D}$

1-19.

(1) $F_1(A, B, C, D) = \sum m(0, 1, 3, 5, 10, 15) + \sum d(2, 4, 9, 11, 14)$

解:

AB\CD	00	01	11	10
00	1	1	1	1
01	x	1		
11			1	x
10			x	1

$F_1 = \bar{A}\bar{B} + \bar{A}\bar{C} + AC$