36) $f(x,y,z) = (x \Rightarrow y) \cdot (y \Rightarrow z) \cdot (z \Rightarrow x)$

x	y	z	$\bar{x} \vee y$ * $x \Rightarrow y$	# $y \Rightarrow z$	$ $z \Rightarrow x$	$* \wedge \#$	$* \wedge \# \wedge \$$
0	0	0	1	1	1	1	1
0	0	1	1	1	0	1	0
0	1	0	1	0	1	0	0
0	1	1	1	1	0	0	0
1	0	0	0	1	1	0	0
1	0	1	0	1	1	0	0
1	1	0	1	0	1	0	0
1	1	1	1	1	1	1	1

$f(10000001)$

37) намерете п.Ж. за f_i.

$f(x) = \bar{x}$

$f(0) = \bar{0} = 1 = a_0 + a_1 0 = a_0 + 0 = a_0 \Rightarrow a_0 = 1$

$f(1) = \bar{1} = 0 = a_0 + a_1 \cdot 1 = a_1 + 1 = 0 \Rightarrow$

38) $f(x,y) = x \vee y = a_0 + a_1 x + a_2 y + a_{12} xy$

$f(0,0) = 0 = a_0 + a_1 0 + a_2 0 + a_{12} 0 \Rightarrow \boxed{a_0 = 0}$

$f(0,1) = 1 = a_0 + a_1 0 + a_2 \cdot 1 + a_{12} \cdot 0 \cdot 1 \Rightarrow 0 + 0 + a_2 + 0 = 1 \Rightarrow \boxed{a_2 = 1}$

$f(1,0) = 1 = 0 + a_1 1 + 0 + 0 = a_1 + 0 = 1 \Rightarrow \boxed{a_1 = 1}$

$f(1,1) = 0 + \underbrace{1 + 1}_{0} + a_{12} = 1 \Rightarrow 0 + a_{12} = 1$

$\boxed{a_{12} = 1}$

(39) $\overset{\bar{x} \vee y}{x \Rightarrow y}$ $\quad a_0 + a_1 x + a_2 y + a_{12} xy$

$f(0,0) = 1 = a_0 + 0 + 0 + 0 \Rightarrow \boxed{a_0 = 1}$

$f(1,0) = 0 = 1 + a_1 + 0 \Rightarrow \boxed{a_1 = 1}$

$f(0,1) = 1 = 1 + 0 + a_2 + 0 \Rightarrow \boxed{a_2 = 0}$

$f(1,1) = 1 = 1 + 1 + 0 + a_{12} \Rightarrow \boxed{a_{12} = 1}$

П.Ж $= 1 \oplus x \oplus xy$

(40) $f(x,y) = x | y = \overline{xy} = xy \oplus 1$

(41) Намери П.Ж за $f(x,y,z) = (x \Rightarrow y)(y \Rightarrow z)(z \Rightarrow x)$

$x \Rightarrow y = 1 \oplus x + xy$ от (39)

$(1 + x + xy)(1 + y + yz)(1 + z + zx)$

$= (xyyz + xyy + xy + x + xy + xyz + 1 + y + yz)(1 + z + zx)$

$= (\cancel{xyz} + \cancel{xy} + \cancel{xy} + x + xy + \cancel{xyz} + 1 + y + yz)(1 + z + zx)$

$= (x + 1 + y + yz)(1 + z + zx)$

$= x + \cancel{zx} + \cancel{zx} + xy + 1 + z + zx + y + zy + \cancel{zxy} + \cancel{yz} + \cancel{yz} + \cancel{yzx}$

$= x + y + z + zx + zy + 1 + xy$

(42) Проверете дали F е пълно.

$F = \{x \downarrow y\}$

$x \downarrow y = \overline{x \vee y}$

x	y	$x \downarrow y$
0	0	1
0	1	0
1	0	0
1	1	0

T_0 не T_1 не

S (двоинствено) не

Монотонна. Lе от втора степен не.

$d_0 = 1$

$1 \downarrow 1 = 0$ $\nleq 0 \downarrow 0$ е пълна.

(43) Нека $F = \{\bar{x}, xy\}$ проверете дали е пълна [1 а]

	T_0	T_1	S	M	L
$\bar{x}$	–	–	+	–	+
xy	+	+	–	+	–

x	y	xy	xy^*
0	0	0	1
0	1	0	1
1	0	0	1
1	1	1	0

$\bar{x}$

x	f	f^*
0	1	0
1	0	1

(44) $F = \{ \overset{f}{(10)}, \overset{g}{(00110111)} \}$

	T_0	T_1	S	L	M
f	–	–	+	+	–
g	+	+	–	–	+

x	y	z	g	g^*
0	0	0	0	1
0	0	1	0	1
0	1	0	1	0
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	0

за L за M с ПДНФ.

$g(x,y,z) = a_0 + a_1 x + a_2 y + a_3 z + a_{12} xy + a_{13} xz + a_{23} yz + a_{123} xyz$

$g(0,0,0) = 0 \qquad \boxed{a_0 = 0}$

$g(1,0,0) = 0 \qquad 0 + a_1 = 0 \quad \boxed{a_1 = 0}$

$g(0,1,0) = 1 \qquad 0 + 0 + a_2 = 1 \quad \boxed{a_2 = 1}$

$g(0,0,1) = 0 \qquad 0 + a_3 + 0 = 0 \quad \boxed{a_3 = 0}$

$g(1,1,0) = 0 + 1 + a_{12} = 1 \qquad \boxed{a_{12} = 0}$

$g(1,0,1) = \boxed{1 = a_{13}}$

$g(0,1,1) = 1 + a_{23} = 1 \qquad \boxed{a_{23} = 0}$

$g(1,1,1) = \underbrace{1 + 1}_{0} + 0 + a_{123} = 1$

$\boxed{a_{123} = 1}$

$= y \oplus xz \oplus xyz \notin L$

(45) $F = \{ \overset{f}{x \Rightarrow y},\ \overset{g}{\bar{x} \Rightarrow \bar{y}x},\ \overset{h}{x \oplus y \oplus z},\ 1 \}$ Не е пълна.

	T_0	T_1	S	L	M
1	−	+	−	+	+
f	−	+	−	−	−
g	+	+	+	+?	+
h	+	+	+	+	+

$x \Rightarrow y$ $\bar{x} \vee y$

x	y	$\overset{f}{x \Rightarrow y}$	$\bar{x}$	$\bar{y}x$	$\bar{x} \Rightarrow \bar{y}x$
0	0	1	1	0	0
0	1	1	1	0	0
1	0	0	0	1	1
1	1	1	0	0	1

с нол. М

1,1

01   10

(0;0)

x	y	z	$x \oplus y \oplus z$	
0	0	0	0	1
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	0

100   010   001

000

46) $F = \{1, \bar{x}, \overset{f}{x(y \Leftrightarrow z) \oplus \bar{x}(y \oplus z)}, \overset{h}{x \Leftrightarrow y}\}$

	T_0	T_1	S	L	M
1	−	+	−	+	+
$\bar{x}$	−	−	+	+	−
f	+	+	+	+	−
h	−	+	−	+	−

Не е пълна

x	y	z	$\overset{*}{y \Leftrightarrow z}$	$\overset{\#}{x*}$	$y \oplus z$	$\bar{x}(y \oplus z)$	f	f^*
0	0	0	1	0	0	0	0	1
0	0	1	0	0	1	1	1	0
0	1	0	0	0	1	1	1	0
0	1	1	1	0	0	0	0	1
1	0	0	1	1	0	0	1	0
1	0	1	0	0	1	0	0	1
1	1	0	0	0	1	0	0	1
1	1	1	1	1	0	0	1	0

$$x(y+z+1) + (x+1)(y+z) = \cancel{xy} + \cancel{xz} + x + \cancel{xy} + \cancel{xz} + y + z$$
$$= x + y + z$$

110 101 111

100 010 001 011

000

(47) $F = \{x \oplus y,\ xy \oplus z,\ xy \oplus z \oplus 1,\ xy \oplus yz \oplus xz\}$

	T_0	T_1	L	S	M
f_1	+	−	+	−	−
f_2	+	−	−	−	−
f_3	−	+	−	−	+
f_4	+	+	−	+	+

$\overline{\bar{x}\bar{y} + \bar{z}} = (x+1)(y+1) + z + 1 + 1$

$= xy + x + \ldots\ z$ [illegible]

x	y	z	f_1: $x \oplus y$	xy	f_2: $xy \oplus z$	f_3: $\oplus 1$	yz	$xy \oplus yz$	$\oplus$ (xz)	f_4
0	0	0	0	0	0	1	0	0	0	0
0	0	1	0	0	1	0	0	0	0	0
0	1	0	1	0	0	1	0	0	0	0
0	1	1	1	0	1	0	1	1	0	1
1	0	0	1	0	0	1	0	0	0	0
1	0	1	1	0	1	0	0	0	1	1
1	1	0	0	1	1	0	0	1	0	1
1	1	1	0	1	0	1	1	0	1	1

(111)

$\overline{\bar{x}y \oplus \bar{y}\bar{z}} = x+1 + y+1+$

011 110 101

100 010 001

000

$(x+1)(y+1) \oplus z + 1 + 1 + 1$

$= xy + x + z + 1 + 1 + 1 + y + 1$

$=$

(48) Проверете дали $F = (S \cap M) \cup (L \setminus M)$ е пълна?

Започване с отричането.

$\bar{x} = x \oplus 1 \in L \quad \notin M \quad \bar{x} \in L \setminus M \subseteq F$

и $\bar{x} \notin M$, $\bar{x} \notin T_0$, $\bar{x} \notin T_1 \Rightarrow F \subseteq T_0, T_1, M$

Търсим $f_S \in F$ т.че $f_S \notin S$ тоест $f_S \in L \setminus M$

$f_S(x,y) = x \oplus y \in L$

$0,1 \leq (1,1)$ но $0 \oplus 1 = 1 \nleq 0 = 1 \oplus 1$

$\Rightarrow f_S \notin M \Rightarrow f_S \in F$

$x \oplus^* y = \overline{\bar{x} \oplus \bar{y}} = (x+1+y+1) + 1 = x+y+1 \neq x+y : x+y \notin S$

$\Rightarrow F \nsubseteq S$

Тогава търсим $f_L \in F$ и $f_L \notin L$ $\quad f_L = S \cap M$

f_L на 2 аргумента

x	y	f_L	f_L^*
0	0	a	$\bar{d}$
0	1	b	$\bar{c}$
1	0	c	$\bar{b}$
1	1	d	$\bar{a}$

$\Rightarrow$ $f_L \in S \cap M$

0	0	a
0	1	b
1	0	$\bar{b}$
1	1	$\bar{a}$

$a = \bar{d}$

$b = \bar{c}$

от $f_L \in M$

$a \leq b \leq \bar{a}$

$a \leq \bar{b} \leq \bar{a}$

$\Rightarrow a = 0 \quad \bar{a} = 1$

x	y	f_L'	f_L''
0	0	0	0
0	1	0	1
1	0	1	0
1	1	1	1

са линейни

го правим и за 3 аргумента.