02.03 2022 II седмица С.У.

Зад 1. $f(A,B,C,D) = (\overline{\overline{A \cdot D} + D}) \cdot \overline{\overline{B} + \overline{C}} + B \cdot C$

Да се преобразува логическия израз

$f(A,B,C,D) = (\overline{\overline{A} + \overline{D} + D})(BC + BC) =$

$= (\underbrace{\overline{A} + 1}_{1}) \cdot BC + BC = \overline{A}BC + BC + BC = \overline{A}BC + BC =$

$= BC + BC = \boxed{B \cdot C}$

Зад 2 Дадена е $f(x_0,x_1,x_2,x_3) = \overline{x_0}x_1 + x_1\overline{x_2}x_3 + x_0\overline{x_1}x_2x_3$

Каква е аналитичната форма на f? - ДУНФ

Изведете СДУНФ, СКУНФ, ТИ и УКУК?

а) $f(x_0,x_1,x_2,x_3) = \overline{x_0}x_1(x_2+\overline{x_2})(x_3+\overline{x_3}) + (x_0+\overline{x_0})(x_1\overline{x_2}x_3) + x_0\overline{x_1}\,\overline{x_2}\,x_3 =$

$= \overline{x_0}x_1(x_2x_3 + x_2\overline{x_3} + \overline{x_2}x_3 + \overline{x_2}\,\overline{x_3}) + x_0x_1\overline{x_2}x_3 + \overline{x_0}x_1x_2x_3 =$

$= \overline{x_0}x_1x_2x_3 + \overline{x_0}x_1x_2\overline{x_3} + \overline{x_0}x_1\overline{x_2}x_3 + \overline{x_0}x_1\overline{x_2}\,\overline{x_3} + x_0x_1\overline{x_2}x_3 + \overline{x_0}x_1x_2x_3 + x_0x_1x_2x_3$

№ 9

в) ТИ

| | $x_0$ | $x_1$ | $x_2$ | $x_3$ | $f$ |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 2 | 0 | 0 | 1 | 0 | 0 |
| 3 | 0 | 0 | 1 | 1 | 0 |
| 4 | 0 | 1 | 0 | 0 | 1 |
| 5 | 0 | 1 | 0 | 1 | 1 |
| 6 | 0 | 1 | 1 | 0 | 1 |
| 7 | 0 | 1 | 1 | 1 | 1 |
| 8 | 1 | 0 | 0 | 0 | 0 |
| 9 | 1 | 0 | 0 | 1 | 1 |
| 10 | 1 | 0 | 1 | 0 | 0 |
| 11 | 1 | 0 | 1 | 1 | 0 |
| 12 | 1 | 1 | 0 | 0 | 0 |
| 13 | 1 | 1 | 0 | 1 | 1 |
| 14 | 1 | 1 | 1 | 0 | 0 |
| 15 | 1 | 1 | 1 | 1 | 0 |

г) УКУК

| $x_0x_1$ \ $x_2x_3$ | 00 | 01 | 11 | 10 |
|---|---|---|---|---|
| 00 | 0 | 0 | 0 | 0 |
| 01 | 1 | 1 | 1 | 1 |
| 11 | 0 | 1 | 0 | 0 |
| 10 | 0 | 1 | 0 | 0 |

8) $f(x_0x_1x_2x_3) = (x_0+x_1+x_2+x_3)(x_0+x_1+x_2+\overline{x_3})(x_1+x_2+x_3+x_4)(x_1+x_2+x_3+x_4)(x_1+x_2+x_3+x_4)(x_1+x_2+x_3+x_4)(x_1+x_2+x_3+x_4)(x_1+x_2+x_3+x_4)($

Зад 3 За $f(x_0, x_1, x_2, x_3) = Vm(4,5,6,7,9,13)$
да се попълни КК и да се изведат МДНФ
и МКНФ

а)

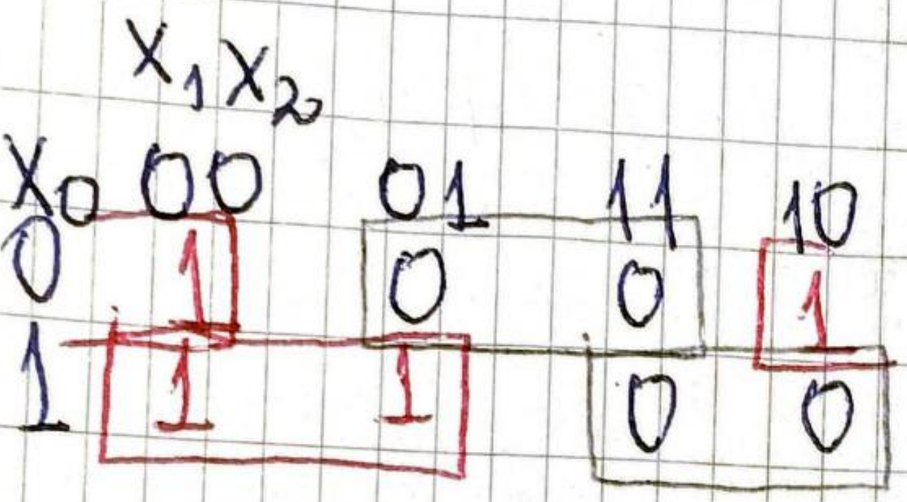
| $x_0x_1$ \ $x_2x_3$ | 00 | 01 | 11 | 10 |
|---|---|---|---|---|
| 00 | 0 | 0 | 0 | 0 |
| 01 | 1 | 1 | 1 | 1 |
| 11 | 0 | 1 | 0 | 0 |
| 10 | 0 | 1 | 0 | 0 |

б) $f_{МДНФ} = \overline{x_0}x_1x_3 \vee x_0\overline{x_1}$

в) $f_{МКНФ} = \overline{x_0}x_1(x_0 \vee \overline{x_1})(\overline{x_0} \vee x_3)$

Зад 4

$f(x_0, x_1, x_2) = V_m(0,2,4,5)^1$. Изведете ДНФ, СКНФ -




а) ДНФ = $\boxed{x_0\bar{x}_1 + \bar{x}_0\bar{x}_2}$

б) КНФ = $\boxed{(x_0 + \bar{x}_2)(\bar{x}_0 + \bar{x}_1)}$

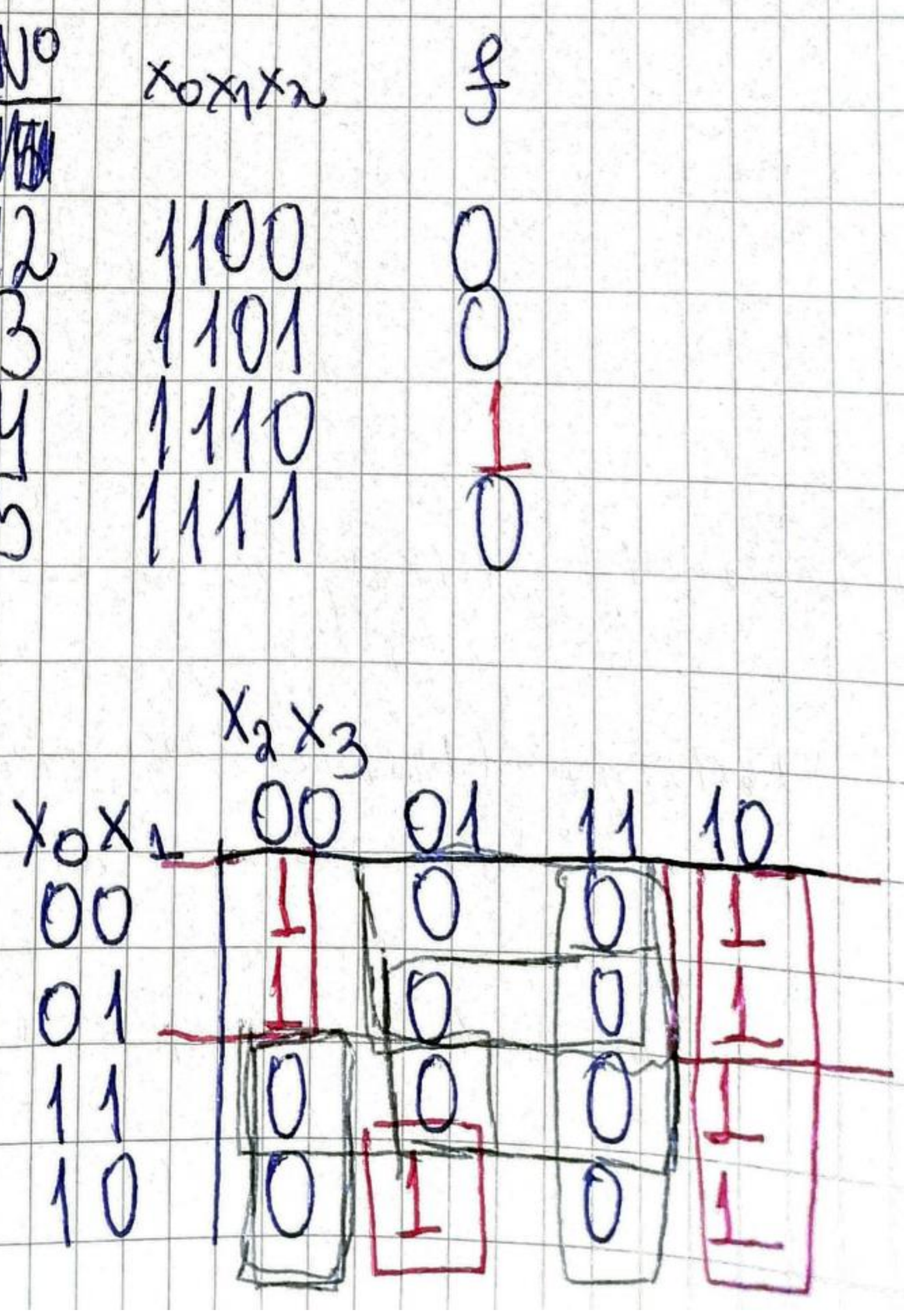
Зад 5.

$f(x_0, x_1, x_2, x_3) = V_m(0,2,4,6,9,10,14)^1$. Изведете ТИ, УКК, СУКНФ, МДНФ, МКНФ.

а)

| № | $x_0$ | $x_1$ | $x_2$ | $x_3$ | f |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 2 | 0 | 0 | 1 | 0 | 1 |
| 3 | 0 | 0 | 1 | 1 | 0 |
| 4 | 0 | 1 | 0 | 0 | 1 |
| 5 | 0 | 1 | 0 | 1 | 0 |
| 6 | 0 | 1 | 1 | 0 | 1 |
| 7 | 0 | 1 | 1 | 1 | 0 |
| 8 | 1 | 0 | 0 | 0 | 0 |
| 9 | 1 | 0 | 0 | 1 | 1 |
| 10 | 1 | 0 | 1 | 0 | 1 |
| 11 | 1 | 0 | 1 | 1 | 0 |
| 12 | 1 | 1 | 0 | 0 | 0 |
| 13 | 1 | 1 | 0 | 1 | 0 |
| 14 | 1 | 1 | 1 | 0 | 1 |
| 15 | 1 | 1 | 1 | 1 | 0 |

б)



в) функция = $\Lambda M(1,3,5,7,8,11,12,13,15)^0$

г) функция = $\overline{\overline{x_0}\overline{x_3} + x_0\overline{x_1}\overline{x_2}x_3 + \overline{x_2}x_3}$

д) функция = $\overline{(x_0 + \overline{x_3})(\overline{x_2} + \overline{x_3})(\overline{\overline{x_0} + x_1 + x_2})(\overline{x_0 + x_2 + x_3})}$
$= \overline{(x_0 + \overline{x_3})(\overline{x_2} + x_3)(\overline{x_1} + \overline{x_3})(\overline{x_0} + x_2 + x_3)}$