**Надокнада I колоквијума из Основа рачунарске технике I - 2012/2013**
(22.04.2013.)
**Р е ш е њ е**

## Задатак 1

$$f(x_1,x_2,x_3,x_4)=\overline{(x_1+\bar{x}_2\cdot\bar{x}_3\cdot\bar{x}_4)\cdot(x_2+\overline{(x_3+x_4)}\cdot(x_3+\bar{x}_4))}$$
$$f(x_1,x_2,x_3,x_4)=\overline{(x_1+\bar{x}_2\cdot\bar{x}_3\cdot\bar{x}_4)}+\overline{(x_2+\overline{(x_3+x_4)}\cdot(x_3+\bar{x}_4))}$$
$$f(x_1,x_2,x_3,x_4)=\bar{x}_1\cdot(x_2+x_3+x_4)+\overline{(x_2+\bar{x}_3\cdot\bar{x}_4\cdot(x_3+\bar{x}_4))}$$
$$f(x_1,x_2,x_3,x_4)=\bar{x}_1\cdot(x_2+x_3+x_4)+\overline{(x_2+\bar{x}_3\cdot\bar{x}_4)}$$
$$f(x_1,x_2,x_3,x_4)=\bar{x}_1\cdot(x_2+x_3+x_4)+\bar{x}_2\cdot(x_3+x_4)$$
$$f(x_1,x_2,x_3,x_4)=\bar{x}_1\cdot x_2+\bar{x}_1\cdot x_3+\bar{x}_1\cdot x_4+\bar{x}_2\cdot x_3+\bar{x}_2\cdot x_4$$

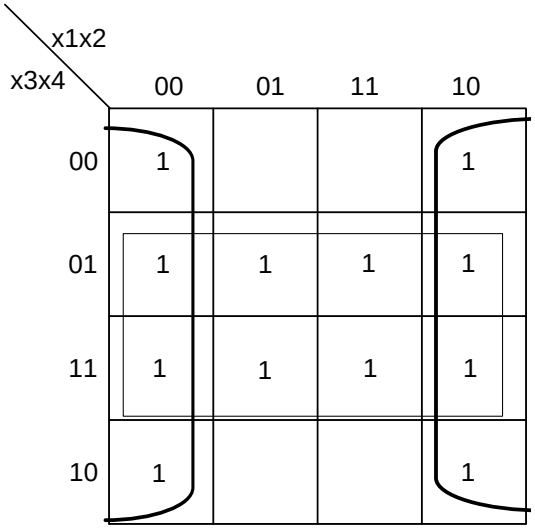
f(1) ={01XX, 0X1X, 0XX1, X01X, X0X1}
={0001, 0010, 0011, 0100, 0101, 0110, 0111, 1001, 1010, 1011}
={1, 2, 3, 4, 5, 6, 7, 9, 10, 11}
f(0) ={0, 8, 12, 13, 14, 15}

$$f(x_1,x_2,x_3,x_4)=(x_1+x_2+x_3+x_4)\cdot(\bar{x}_1+x_2+x_3+x_4)\cdot(\bar{x}_1+\bar{x}_2+x_3+x_4)\cdot(\bar{x}_1+\bar{x}_2+x_3+\bar{x}_4)\cdot$$
$$\cdot(\bar{x}_1+\bar{x}_2+\bar{x}_3+x_4)\cdot(\bar{x}_1+\bar{x}_2+\bar{x}_3+\bar{x}_4)$$

## Задатак 2

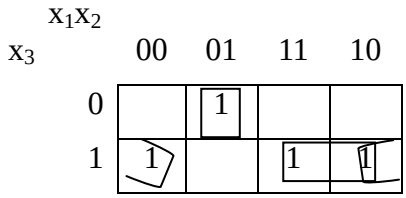
a) $$f(x_1,x_2,x_3,x_4)=\overline{\overline{(\overline{\overline{(\bar{x}_1\cdot x_2}+x_4)}+(\bar{x}_1+\overline{\overline{x_2\cdot\bar{x}_4}})}\cdot\overline{((x_1+\bar{x}_1)\cdot x_2}+x_2)}$$
$$f(x_1,x_2,x_3,x_4)=\overline{\overline{(\overline{\bar{x}_1\cdot x_2}+x_4)}}\cdot\overline{\overline{(\bar{x}_1+\overline{x_2\cdot\bar{x}_4})}}\cdot(\bar{x}_2+x_2)$$
$$f(x_1,x_2,x_3,x_4)=(\overline{\bar{x}_1\cdot x_2}+x_4)\cdot(\bar{x}_1+\overline{x_2\cdot\bar{x}_4})$$
$$f(x_1,x_2,x_3,x_4)=(x_1+\bar{x}_2+x_4)\cdot(\bar{x}_1+\bar{x}_2+x_4)$$

f(0)={01X0,11X0}=
={0100, 0110, 1100, 1110}={4, 6, 12, 14}
f(1)={0, 1, 2, 3, 5, 7, 8, 9, 10, 11, 13, 15}



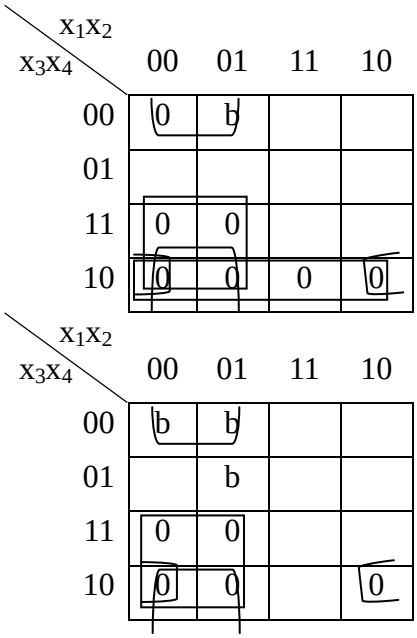

$$f(x_1,x_2,x_3,x_4)=\bar{x}_2+x_4$$

б)




$$f(x_1, x_2, x_3) = x_1x_3 + \bar{x}_2x_3 + \bar{x}_1x_2\bar{x}_3$$

в)




$$f(x_1, x_2, x_3, x_4, x_5) = (x_2 + x_5) \cdot (x_2 + \bar{x}_4) \cdot (x_1 + \bar{x}_4 + x_5) \cdot (x_3 + \bar{x}_4 + x_5)$$

## Задатак 3

| i | $x_1\ x_2\ x_3\ x_4\ x_5$ | AM | PM |
|---|---|---|---|
| 0 | 0 0 0 0 0 | 1 | 0 |
| 1 | 0 0 0 0 1 | 1 | 0 |
| 2 | 0 0 0 1 0 | 1 | 0 |
| 3 | 0 0 0 1 1 | 1 | 0 |
| 4 | 0 0 1 0 0 | 1 | 0 |
| 5 | 0 0 1 0 1 | 1 | 0 |
| 6 | 0 0 1 1 0 | 1 | 0 |
| 7 | 0 0 1 1 1 | 1 | 0 |
| 8 | 0 1 0 0 0 | 1 | 0 |
| 9 | 0 1 0 0 1 | 1 | 0 |
| 10 | 0 1 0 1 0 | 1 | 0 |
| 11 | 0 1 0 1 1 | 1 | 0 |
| 12 | 0 1 1 0 0 | 0 | 1 |
| 13 | 0 1 1 0 1 | 0 | 1 |
| 14 | 0 1 1 1 0 | 0 | 1 |
| 15 | 0 1 1 1 1 | 0 | 1 |
| 16 | 1 0 0 0 0 | 0 | 1 |
| 17 | 1 0 0 0 1 | 0 | 1 |

| | | | |
|---|---|---|---|
| 18 | 1 0 0 1 0 | 0 | 1 |
| 19 | 1 0 0 1 1 | 0 | 1 |
| 20 | 1 0 1 0 0 | 0 | 1 |
| 21 | 1 0 1 0 1 | 0 | 1 |
| 22 | 1 0 1 1 0 | 0 | 1 |
| 23 | 1 0 1 1 1 | 0 | 1 |
| 24 | 1 1 0 0 0 | 1 | 0 |
| 25 | 1 1 0 0 1 | b | b |
| 26 | 1 1 0 1 0 | b | b |
| 27 | 1 1 0 1 1 | b | b |
| 28 | 1 1 1 0 0 | b | b |
| 29 | 1 1 1 0 1 | b | b |
| 30 | 1 1 1 1 0 | b | b |
| 31 | 1 1 1 1 1 | b | b |

$$AM = \overline{x_1} \cdot \overline{x_2} + x_2 \cdot \overline{x_3}$$
$$PM = x_2 \cdot x_3 + x_1 \cdot \overline{x_2}$$

Користећи ове излазе мреже, треба нацртати комбинациону мрежу.