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Ex 1

$$F = x_1 \bar{x}_4 \left(\overline{\overline{\bar{x}_2 x_3} + \bar{x}_2} \right) + \left(\overline{x_4 + \bar{x}_3} \right) \left(x_1 x_2 + \bar{x}_1 \right) +$$

$$+ \overline{\left(x_1 + \bar{x}_2 + x_4 \right)}$$

1. legea complementări:

$$\bar{x}_4 x_3 \left(x_1 x_2 + \bar{x}_1 \right) + \bar{x}_1 x_2 \bar{x}_4$$

2. legea absorției:

$$\bar{x}_4 x_3 \left(x_2 + \bar{x}_1 \right) + \bar{x}_1 x_2 \bar{x}_4$$

3. legea distributivă:

$$x_2 x_3 \bar{x}_4 + \bar{x}_1 x_3 \bar{x}_4 + \bar{x}_1 x_2 \bar{x}_4$$

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ex.2

$$F = \begin{cases} F_1 = \Sigma(1,2,5,6,8,9,10,11) \\ F_2 = \Sigma(1,2,4,5,6,7,10,12) \end{cases}$$

	x_1	x_2	x_3	x_4	F_1	F_2
0	0	0	0	0	0	0
1	0	0	0	1	1	1
2	0	0	1	0	1	1
3	0	0	1	1	0	0
4	0	1	0	0	0	1
5	0	1	0	1	1	1
6	0	1	1	0	1	1
7	0	1	1	1	0	1
8	1	0	0	0	1	0
9	1	0	0	1	1	0
10	1	0	1	0	1	1
11	1	0	1	1	1	0
12	1	1	0	0	0	1
13	1	1	0	1	0	0
14	1	1	1	0	0	0
15	1	1	1	1	0	0

$$F_1 = x_1 \bar{x}_2 + \bar{x}_2 x_3 \bar{x}_4 + \bar{x}_1 \bar{x}_3 x_4$$

$$F_2 = \bar{x}_1 x_2 + \bar{x}_2 x_3 \bar{x}_4 + \bar{x}_1 \bar{x}_3 x_4 + x_2 \bar{x}_3 \bar{x}_4$$

$$Z_1 = \bar{x}_1 \bar{x}_3 x_4$$

$$F_1 = x_1 \bar{x}_2 + \bar{x}_2 x_3 \bar{x}_4 + Z_1$$

$$F_2 = \bar{x}_1 x_2 + \bar{x}_2 x_3 \bar{x}_4 + Z_1 + x_2 \bar{x}_3 \bar{x}_4$$

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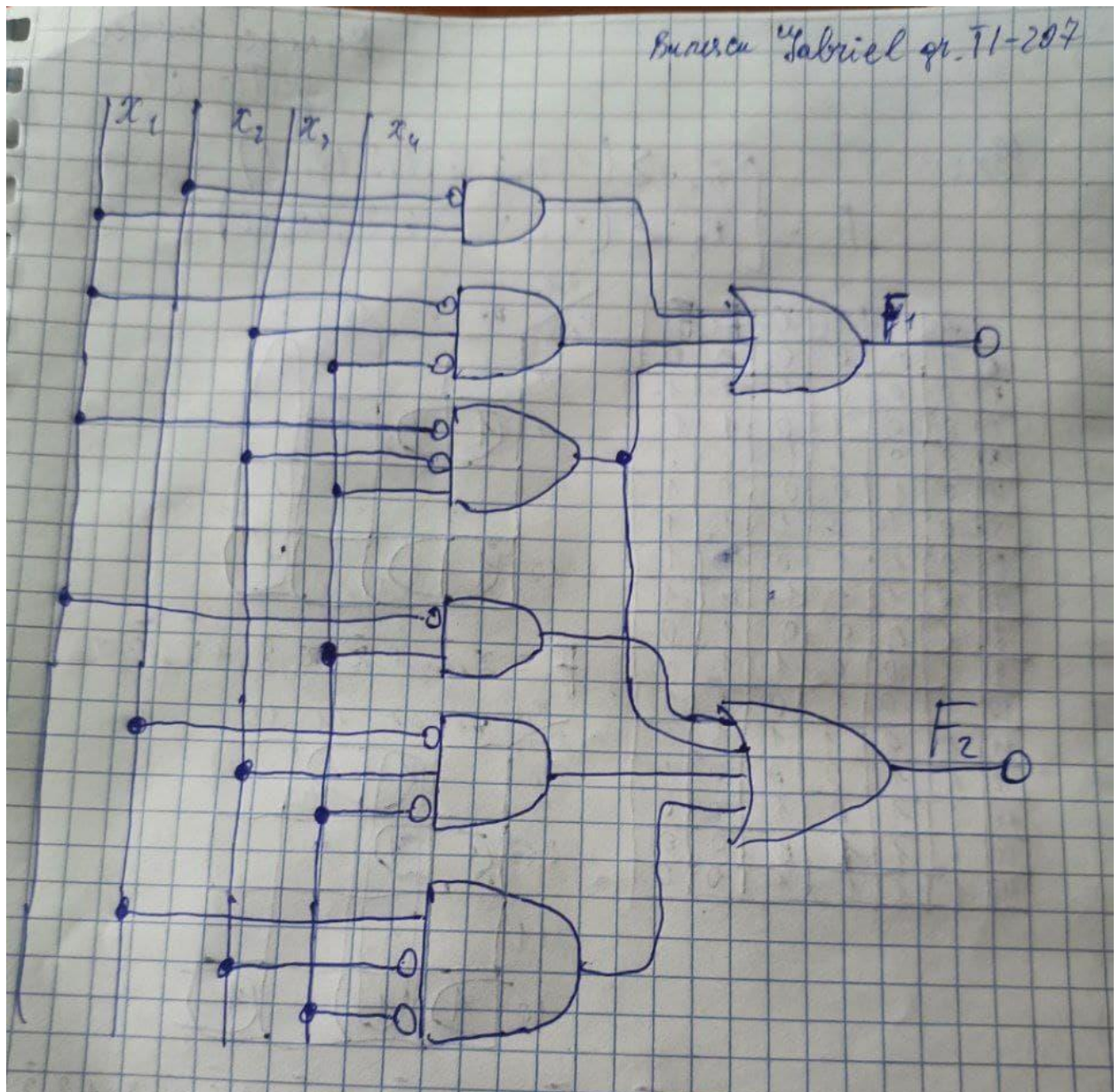
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Ex 3

$$X = 110000_2 \qquad Y = 0,423_6 \qquad Z = B8A_{16}$$

$$X = \overset{5}{1}\overset{4}{1}\overset{3}{0}\overset{2}{0}\overset{1}{0}\overset{0}{0}_2 = 1 \cdot 2^5 + 1 \cdot 2^4 = 32 + 16 = 48_{10}$$

$$Y = 0,\overset{-1}{4}\overset{-2}{2}\overset{-3}{3}_6 = 4 \cdot 6^{-1} + 2 \cdot 6^{-2} + 3 \cdot 6^{-3} = 0,66 + 0,055 +$$
$$+ 0,0138 = 0,7288_{10}$$

$$Z = \overset{2}{B}\overset{1}{8}\overset{0}{A}_{16} = 11 \cdot 16^2 + 8 \cdot 16^1 + 10 \cdot 16^0 =$$
$$= 2816 + 128 + 10 = 2954_{10}$$

Ex 4

$$X = 58 \qquad Y = -63 \qquad Z = -0,68$$

Cod direct:

58 : 2 = 28	0	63 : 2 = 31	1	0,68 · 2 = 1,36
29 : 2 = 14	1	31 : 2 = 15	1	0,36 · 2 = 0,72
14 : 2 = 7	0	15 : 2 = 7	1	0,72 · 2 = 1,44
7 : 2 = 3	1	7 : 2 = 3	1	0,44 · 2 = 0,88
3 : 2 = 1	1	3 : 2 = 1	1	0,88 · 2 = 1,76
1 : 2 = 0	1	1 : 2 = 0	1	0,76 · 2 = 1,52

$$X = 00111010_2 \qquad Y = 1011111_2 \qquad Z = 1,101011_2$$

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Cod invers

$X = 0011101 0_2$ $Y = 0100000 0_2$ $Z = 0,01010 0_2$

Cod Complementar:

$X = 0011101 0_2$ $Y = 0100000 1_2$ $Z = 1,01010 0_2$

$X + Y$ – cod invers $X - Y$

```
0011101 0 +
0100000 0
─────────
0111101 0
```

```
0011101 0 ‑
0100000 0
─────────
1000011 0
```

Cod complementar :

$X + Y$ $X - Y$

```
0011101 0 +
0100000 1
─────────
0111101 1
```

```
0100000 1 ‑
0011101 0
─────────
1000011 1
```