Problem 4. «System of equations»

Analyzing a cipher Caroline gets the following system of equations in binary variables $x_1, x_2, \ldots, x_{16}$ that represent the unknown bits of the secrete key:

$$\begin{cases} x_1 x_3 \oplus x_2 x_4 = x_5 - x_6, \\ x_{14} \oplus x_{11} = x_{12} \oplus x_{13} \oplus x_{14} \oplus x_{15} \oplus x_{16}, \\ (x_8 + x_9 + x_7)^2 = 2(x_6 + x_{11} + x_{10}), \\ x_{13} x_{11} \oplus x_{12} x_{14} = -(x_{16} - x_{15}), \\ x_5 x_1 x_6 = x_4 x_2 x_3, \\ x_{11} \oplus x_8 \oplus x_7 = x_{10} \oplus x_6, \\ x_6 x_{11} x_{10} \oplus x_7 x_9 x_8 = 0, \\ \left(\frac{x_{12} + x_{14} + x_{13}}{\sqrt{2}}\right)^2 - x_{15} = x_{16} + x_{11}, \\ x_1 \oplus x_6 = x_5 \oplus x_3 \oplus x_2, \\ x_6 x_8 \oplus x_9 x_7 = x_{10} - x_{11}, \\ 2(x_5 + x_1 + x_6) = (x_4 + x_3 + x_2)^2, \\ x_{11} x_{13} x_{12} = x_{15} x_{14} x_{16}. \end{cases}$$

Help Caroline to find the all possible keys!

Remark. If you do it in analytic way (without computer calculations) you get twice more scores.