Local solvability and non-solvability are classified for certain operators which are left-invariant on the Heisenberg group $\mathbb{H}_1$ of order $n \geq 2$. For a large subclass of our operators, (non-) solvability is determined by the highest order terms in $X$ and $Y$. We study operators which can be written in form of polynomials with constant coefficients

$$P(X,Y) = P_n(X,Y) + Q(X,Y).$$

Here $P_n$ is a homogeneous polynomial of degree $n \geq 2$ in a certain broad (so-called "generic") class; $Q$ is any such polynomial but of order less than $n$; and, $X, Y$ are the vector fields $X = \partial_x$, $Y = \partial_y + x\partial_z$.

Our operators can be viewed as perturbations of operators whose ($C^\infty$) solvability is already classified in the present representation: $P_n(X,Y)$ is locally solvable if and only if the adjoint operators of both $\ker P(\pm i\partial_t, t)$ contain only the zero function. The solvability in our more general class is examined via asymptotic estimates of solutions certain ode’s with a large parameter, analytic extensions of such solutions and a classification of related scattering matrices. (Received September 10, 2010)