1086-39-1857 **Mikheil Tutberidze*** (mikheil.tutberidze@iliauni.edu.ge), 3/5 Kakutsa Cholokashvili ave., 0162 Tbilisi, Rep of Georgia, **George Katsia** (gkatsia@delta.ge), 2 Gaprindauli str., 0154 Tbilisi, Rep of Georgia, and **Soso Pipia** (jpipia@delta.ge), 2 Gaprindauli str., 0154 Tbilisi, Rep of Georgia. *Numerical Solution and Convergence of the Difference Scheme for Initial-Boundary Value Problem to One Nonlinear Parabolic Equation.*

In the presented work the difference scheme for initial-boundary problem to the following nonlinear parabolic equation

$$\frac{\partial U}{\partial t} = a\left(x,\, t,\, U\right)\frac{\partial^2 U}{\partial x^2} + b\left(x,\, t,\, U\right)\left(\frac{\partial U}{\partial x}\right)^2 + f\left(x,\, t\right)$$

is constructed. The coefficients $a\left(x,\, t,\, U\right)$ and $b\left(x,\, t,\, U\right)$ are required to be continuous and to have continuous partial derivative with respect to argument U. Additionally coefficient $a\left(x,\, t,\, U\right)$ is required to be positive. The function $f\left(x,\, t\right)$ is required to be continuous. For the mentioned difference scheme the theorem of existence of its solution and the theorem of convergence of its solution to the solution of the source problem are proved. The rate of convergence is established and it is equal to $O\left(\tau + h^2\right)$ The corresponding numerical experiments are conducted which confirm the validity of the theorems. (Received September 24, 2012)