TWO NUMERICAL METHODS FOR SOLVING NONLINEAR INTEGRAL EQUATION IN TWO-DIMENSIONAL PROBLEMS

M.A. Abdou[1] & S. Ahamed[2]

[1]Research Associate, Department of Mathematics, Faculty of Education, Alexandria University, Egypt

[2]Research Associate, Department of Mathematics, Faculty of Science, Damanhur University, Egypt

ABSTRACT

In this paper, the existence and uniqueness solution of nonlinear integral equations in two-dimensional problems is considered in the space $L_2(D) \times C(0,T)$, where D is the domain of integration with respect to position, while $t \in [0,T]$, $T < 1$ is the time. The equation takes a form of Fredholm- Volterra integral equation in nonlinear type (NF-VIE). Here, we represent the unknown function in the form of Chebeyshev and Legendre polynomials and then, using Collocation and Galerkin methods, as two numerical methods, the numerical solutions of the NF-VIE are obtained. Numerical results are computed and the error, in each case is calculated.

KEYWORDS: *Two-Dimensional Problems- Nonlinear Fredholm –Volterra Integral Equation- Collocation And Galerkin Methods- Chebeyshev And Legendre Polynomials- Continuous Kernel*