Symmetric Bernstein Polynomial Approach for the System of Volterra Integral Equations on Arbitrary Interval and Its Convergence Analysis

ABSTRACT

In this paper, a new numerical technique is introduced to find the solution of the system of Volterra integral equations based on symmetric Bernstein polynomials. The use of Bernstein polynomials to find the numerical solutions of differential and integral equations increased due to its fast convergence. Here, the numerical solution of the system of Volterra integral equations on any finite interval [m, n] is obtained by replacing the unknown functions with the generalized Bernstein basis functions. The proposed technique converts the given system of equations into the system of algebraic equations which can be solved by using any standard rule. Further, Hyers–Ulam stability criteria are used to check the stability of the given technique. The comparison between exact and numerical solution for the distinct nodes is demonstrated to show its fast convergence.