COLLOCATION TAU NUMERICAL SOLUTIONS FOR SECOND ORDER NONLINEAR INTEGRO-DIFFERENTIAL EQUATIONS BY CANONICAL POLYNOMIALS

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Abstract

In this paper, a method based on the Tau method by canonical polynomials as our basis function is developed to find the numerical solutions of second order nonlinear Integro-Differential Equations. The second order differential part appearing in the equation is used to construct our canonical polynomials and the nonlinear cases are treated by the Newton's linearization scheme of order 2. From the computational viewpoint, the method is more efficient, convenient, reliable, easy to program and superior to many existing methods in terms of its simplicity of application and accuracy. Numerical examples are given to illustrate the accuracy and computational cost of the methods discussed.

Pioneer Journal of Advances in Applied Mathematics

PSP Pioneer Scientific Publisher