Numerical solution to system of linear integro differential difference equations using polynomial collocation method

Binta B. Abubakar[1], A. O. Adesanya[2]
O. R. Odekunle[2]

[1] *Department of Mathematics, School of Science and Technology, Adamawa State Polytechnic, Yola, Nigeria*
kwalliya@mautech.edu.ng
[2] *Department of Mathematics, School of Physical Sciences, Modibbo Adama University of Technology, Yola, Nigeria.*

Abstract: In this research, we consider polynomial collocation method for the solution of linear integro differential difference equations with mixed conditions. The uniqueness and convergence of the solution are established. The state equation is transformed into system of linear algebraic equations using standard collocation points and then solved using matrix inversion method. The solution of the algebraic equations is substituted into the approximate solution to obtain the numerical solution. The method is shown to be convergent, numerical examples show that the method is efficient in terms of consistency and accuracy.

Keywords: Operational Matrix, Integro Differential Equation, Difference Equation, Mixed Condition, Fredholm Integro Differential Equation.