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A MODERN APPROACH BASED ON BERNSTEIN POLYNOMIAL MULTIWAVELETS TO SOLVE FREDHOLM INTEGRAL AND SYSTEM OF FREDHOLM INTEGRAL EQUATIONS

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Abstract: The objective of this paper is to obtain the approximate solution of integral and system of integral equations using Bernstein Polynomial Multiwavelets (BPMW). BPMW are used to obtain the approximate solution of Fredholm integral and system of Fredholm integral equations. These BPMW reduces the given equations into a system of linear (or nonlinear) algebraic equations, which are solved by appropriate methods. Error estimate of the proposed method is given. To illustrate our numerical findings a number of computational experiments are carried out.

Keywords and Phrases: Berstein polynomials, Berstein polynomial multiwavelets, Linear Fredholm integral equations, Nonlinear Fredholm integral equations, System of Fredholm integral equations.

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1. Introduction

Integral equations have been one of the essential tools in different areas of applied mathematics. Integral equations are extensively involved in several problems in science and technology [1, 9, 22]. In several physical models and fields of engineering, such as spectroscopy, radiography, image processing, and cosmic radiation Fredholm integral exist.

Many specific orthonormal basis functions have been used in recent years, such as Fourier functions, wavelets etc., to obtain approximate the solution of these