Abstract

The aim of the thesis is to analyse the solutions of fractional partial differential equations. The well known fractional partial differential equations such as fractional integrodifferential equation, fractional diffusion - wave equation, fractional Burgers equation, fractional Schrödinger equation, fractional Black Scholes equation and system of fractional partial differential equations are considered. Existence of fractional integrodifferential equation is studied by using the Leray - Schauder fixed point theorem and the Lebesgue dominated convergence theorem. Variable separable method is used to find the solution of fractional diffusion - wave equation. Fractional Burgers equation is solved by using Cole - Hopf transformation technique. Adomian decomposition method is used to find the series solutions of fractional Schrödinger equation, fractional Black Scholes equation and system of fractional partial differential equations. Results are analysed by plotting the solutions for various fractional orders. Finally the numerical results are tabulated to compare the accuracy of the solution with other numerical methods.