

Notification No: 574/2025

Date of Award: 17-01-2025

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Topic of Research: "Fixed Point Theorems in Generalized Metric Spaces"

Findings

The entire work is organized into four chapters.

Chapter 1 The first chapter is introduction, in which some basic definitions and results which are needed to prove the results in the subsequent chapters have been stated.

Chapter 2 This chapter has been divided into three sections. In the first section, we introduced Meir-Keeler contraction in rectangular M-metric space with applications. In the Section-2, we proved F-contraction for a rectangular M-metric space. We also constructed numerical examples to support our theorems with an application.

Chapter 3 This chapter has been divided into two sections. The first section of the chapter is generalized F-Suzuki contraction in the framework of M-Metric space with numerical example. We also show the applicability of our result. In the second section, we introduce F_E-contraction in M-metric space and prove a fixed point theorem for it. We also give an example with showing the applicability of our result.

Chapter 4 This chapter has been divided into three sections. In the Section-1, we introduced and extend the fixed point theorems of Amini-Harandi and Emami upto a locally H-transitive binary relation. Further, we give an application of our newly proved results to ODE. In the second section, we introduced relation-theoretic version of BCP and Boyd and Wong contraction in M-metric space is shown in these results. In third section, we introduced some results on fixed points employing relational Geraghty contractions in the setting of metric space endowed with a class of transitive binary relations and also discuss an existence and uniqueness theorem regarding the positive solutions of certain boundary value problems associated with a singular fractional differential equations.