

## NEW RESULTS IN CONE PENTAGONAL METRIC SPACES

**Shishir Jain and Pooja Chaubey**

Department of Mathematics,  
Shri Vaishnav Vidyapeeth Vishwavidyalaya,  
Sanwer Road, Indore - 453331, Madhya Pradesh, INDIA

E-mail : jainshishir11@rediffmail.com, chaubey.pooja8991@gmail.com

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**Abstract:** In the present paper, we establish the proof of a fixed point result for ordered Reich type contraction in cone pentagonal metric spaces with the cone which is not necessarily normal. The obtained results are new and generalize the results of Reich [17], Auwalu A. [1] and Garg et. al. [7] in ordered cone pentagonal metric spaces.

**Keywords and Phrases:** Cone pentagonal metric space, fixed point, ordered Reich type contraction.

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### 1. Introduction

In literature, the concept of substituting the set of real numbers by ordered “set” was first given by Kurepa [14]. Zabreiko [18] in 1997 worked on the idea of Kurepa [14] and introduced  $K$ -metric and  $K$ -normed spaces in which the set of real numbers were replaced by an ordered Banach space. Following the work of Zabreiko [18], in 2007 Huang and Zhang [8] introduced cone metric spaces by replacing Banach space in usual metric with ordered Banach space and defined convergence criteria in these new settings with fixed point theorem. After that several authors([1], [5], [6], [9], [10], [16], [15]) worked on the results of Huang and Zhang [8]. Branciari [4] introduced rectangular metric spaces in which triangular inequality is substituted by rectangular inequality and proved Banach contraction principle in rectangular metric spaces. Azam et. al. [3] followed the concept given