

DIFFERENT CLASSES OF CONTINUITY IN CONE METRIC SPACES

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Abstract. The different forms of continuity are discussed thoroughly on cone metric spaces. A new notion namely Lebesgue cone metric spaces is also introduced in this paper. We established certain equivalent conditions on Lebesgue cone metric spaces.

1. Introduction

Huang and Zhang [10] revived the concept of a cone metric, which had been known since the mid-twentieth century(see [9, 14, 17]). Cone metric space is an intriguing generalisation of metric space in which the set of real numbers is replaced with an ordered Banach space. In [10] the authors introduced completeness and discussed convergence in cone metric spaces. Cone metric spaces are generalisations of metric spaces that play an essential role in fixed point theory, computer science, and certain other areas of general topology (see, for instance, [1, 2, 3, 4, 5, 7, 8, 13, 16, 6]). Yaari et al. [18] established new notions of continuity between cone metric spaces, quasi cone metric spaces and vice-versa. In this paper we have generalized the notions of uniform continuity, almost uniform continuity, Cauchy continuity and other related notions from [11] and [12] from metric spaces to cone metric spaces. Uniform continuity in a cone metric space and TVS-cone metric space is discussed in [19] and [5], respectively. In this paper we have studied uniform continuity in two distinct cone metric spaces.

2. Preliminaries

Definition 2.1. [10] Consider a real Banach space E and P be a set contained in E . The set P is called a cone if

- (i) $P \neq \{0\}, P \neq \phi$ and $Cl(P) = P$.

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