



SOME FIXED POINT RESULTS ON M_b -METRIC SPACES VIA SIMULATION FUNCTIONS

Benjawan Rodjanadid^{1,*} and Jessada Tanthanuch²

¹ School of Mathematics, Institute of Science, Suranaree University of Technology, Nakhon Ratchasima, 30000, Thailand, e-mail : benjawan@sut.ac.th

² School of Mathematics, Institute of Science, Suranaree University of Technology, Nakhon Ratchasima, 30000, Thailand, e-mail : jessada@g.sut.ac.th

Abstract In this research, theorems related with the fixed point were extended to be considered on M_b -metric spaces. The concept of an extension was based on the simulation functions introduced by Khojasteh et al. [10] and some results of MLAIKI et al. [13]. This article provides contents of the fixed point theory developed by many mathematicians, and our discovered result, the uniqueness theorem of a fixed point in complete M_b -metric space.

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1. INTRODUCTION AND PRELIMINARIES

The existence of the fixed point theorem in Banach space was first investigated by Banach himself who established the well known Banach contraction principle in 1922 [6]. Applications of the discovery play a major role in the existence theory of differential, integral, partial differential and functional equations [11]. This theorem is a principle tool for providing the existence of solutions in games theory, mathematical economic and some biological models [3, 11]. Ever since the idea of the fixed point theorem was proposed, many mathematicians have developed and extended a number of theories related to it.

In 1989, Bakhtin[5] (see also Czerwik [7]) introduced the concept of a b -metric space and proved some fixed point theorems for some contraction mapping in b -metric spaces. This apprehension generalizes Banach's contraction principle in metric space. After that Matthews[12] introduced the notion of a partial metric space and prolonged the contraction principle of Banach in that new framework in 1994. Shukla[20] combined both concepts of b -metric and partial metric spaces and proposed the partial b -metric space in 2014. The Kannan type fixed point theorem in partial b -metric spaces, which is an analog of Banach contraction principle, was also suggested as well.

In 2014, Asadi et al.[2] introduced M -metric space, which extends the partial metric space and certain fixed point theorems obtained therein. In the later year, Khojasteh et

*Corresponding author.