

Multi-Valued Mappings in Quasi-Partial B-Metric Spaces: A Fixed Point Theorem

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Abstract: Fixed Point theorems for Multi-valued functions in Partial metric spaces and quasi-partial b-metric spaces arise in the treatment of semantics of disjunctive programs and databases, an important area in theoretical computer science. Recently, several authors established generalizations of fixed point theorems (of point-valued functions in complete metric spaces) in the setting of partial b-metric spaces (Aydi *et al*, 2012). Similar generalizations have been made earlier for the case of partial metric spaces. Matthews (1994), who first introduced partial metric spaces, dropped the zero self-distance property in metric spaces, replacing it with the “small self-distance” (SSD) property, and a tighter version of the triangle inequality.

Shukla (2014) introduced the concept of partial b-metric space as a generalization of partial metric spaces and b-metric space. Karapinar (2012) introduced the idea of a quasi-partial metric space, and proved some general fixed point theorems for functions in quasi-partial metric spaces. We will extend this to multi-valued mappings in quasi-partial b-metric spaces, and establish a fixed point theorem for such mappings satisfying a general contraction condition.

Keywords: Quasi-partial b-metric space; Fixed Point theorem