

COMMON FIXED POINT THEOREM IN \mathcal{F} -METRIC SPACES

ANSARI SHAKEEL ANJUM AND CHINTAMAN AAGE

ABSTRACT. This paper establishes common fixed point theorems for four mappings in \mathcal{F} -metric space using weakly compatible mappings and generalizing F -contraction. One supporting example is given.

REFERENCES

- [1] A. Awais, N. Muhammad, A. Muhammad and Sang Og Kim: \mathcal{F} -metric, F -contraction and common fixed-point theorems with applications, *Mathematics*, **7**(2019), No. 7, Art. No. 586, 13 pages.
- [2] M. Abbas and G. Jungck: *Common fixed point results for non commuting mappings without continuity in cone metric spaces*, *J. Math. Anal. Appl.*, **341**(2008), No. 1, 416-420.
- [3] İshak Altun, Gülhan Minak and Hacer Däg: *Multi valued F -contractions on complete metric spaces*, *J. Nonlinear Convex Anal.*, **16**(2015), 659-666.
- [4] A. Branciari: *A fixed point theorem of Banach-Caccioppoli type on a class of generalized metric spaces*, *Publ. Math. Debrecen*, **57**(2000), 31-37.
- [5] S. Czerwik: *Contraction mappings in b -metric spaces*, *Acta Math. Inf. Univ. Ostraviensis*, **1**(1993), No. 1, 5-11.
- [6] V.S. Gahler: *2-metrische Räume und ihre topologische struktur*, *Math. Nachr.*, **2**(1963), 115-118.
- [7] A. Hussain and T. Kanwal: *Existence and uniqueness for a neutral differential problem with unbounded delay via fixed point results*, *Trans. A. Razmadze Math. Inst.*, **172**(2018), 481-490.
- [8] M. Jleli and B. Samet: *A generalized metric space and related fixed point theorems*, *Fixed Point Theory Appl.*, 2015, 2015:61, 14 pages.
- [9] M.A. Khamsi and N. Hussain: *KKM mappings in metric type spaces*, *Nonlinear Anal.*, **7**(2010), 3123-3129.
- [10] D. Klim and D. Wardowski: *Fixed points of dynamic processes of set-valued F -contractions and application to functional equations*, *Fixed Point Theory Appl.*, 2015, 2015:22, 9 pages.
- [11] Z. Mustafa and B. Sims: *A new approach to generalized metric spaces*, *J. Nonlinear Convex Anal.*, **7**(2006), No. 2, 289-297.
- [12] S. Reich: *Some remarks concerning contraction mappings*, *Canad. Math. Bull.*, **14**(1971), 121-124.
- [13] M. Jleli and B. Samet: *On a new generalization of metric spaces*, *J. Fixed Point Theory Appl.*, **20**(2018), Art. No. 128, 20 pages.
- [14] D. Wardowski: *Fixed points of a new type of contractive mappings in complete metric spaces*, *Fixed Point Theory Appl.*, 2012, 2012:94, 6 pages.
- [15] M. Nazam, C. Park, A. Hussain, M. Arshad and J.R. Lee: *Fixed point theorems for F -contractions on closed ball in partial metric spaces*, *J. Comput. Anal. Appl.*, **27**(2019), 759-769.
- [16] M.U. Ali and T. Kamran: *Multivalued F -contractions and related fixed point theorems with an application*, *Filomat*, **30**(2016), 3779-3793.
- [17] M.U. Ali, T. Kamran and M. Postolache: *Solution of Volterra integral inclusion in b -metric spaces via new fixed point theorem*, *Nonlinear Anal. Model. Control*, **22**(2017), 17-30.

Received: March 05, 2022. Revised: August 15, 2022.

2010 *Mathematics Subject Classification*: 54E50, 47H10.

Key words and phrases: Weakly compatible mapping, common fixed point.

- [18] R. Batra and S. Vashistha: *Fixed points of an F-contraction on metric spaces with a graph*, Int. J. Comput. Math., **91**(2014), 2483-2490.
- [19] M. Cosentino and P. Vetro: *Fixed point results for F-contractive mappings of Hardy-Rogers-Type*, Filomat, **28**(2014), 715-722.
- [20] G. Durmaz, G. Minak and I. Altun: *Fixed points of ordered F-contractions*, Hacet. J. Math. Stat., **45**(2016), 15-21.
- [21] M. Nazam, M. Arshad and M. Postolache: *Coincidence and common fixed point theorems for four mappings satisfying $(\alpha s, F)$ -contraction*, Nonlinear Anal. Model. Control, **23**(2018), 664-690.
- [22] T. Kamran, M. Postolache, M.U. Ali and Q. Kiran: *Feng and Liu type F-contraction in b-metric spaces with application to integral equations*, J. Math. Anal., **5**(2016), 18-27.
- [23] T. Suzuki: *Fixed point theorems for single and set-valued F-contractions in b-metric spaces*, J. Fixed Point Theory Appl., **20**(2018), Art. No. 35.
- [24] S. Reich: *Kannans fixed point theorem*, Boll. Unione Mat. Ital., **4**(1971), 1-11.
- [25] S. Reich: *Fixed points of contractive functions*, Boll. Unione Mat. Ital., **5**(1972), 26-42.

University of Mumbai
Department of Mathematics
Maharashtra College of Arts, Science and Commerce
Mumbai, India
E-mail address: shakeelansari9763@gmail.com

KBC North Maharashtra University
Department of Mathematics
KBC North Maharashtra University
Jalgaon, India
E-mail address: caage17@gmail.com