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A GENERAL FIXED POINT THEOREM FOR MAPPINGS SATISFYING A NEW TYPE OF IMPLICIT RELATION IN COMPLETE G-METRIC SPACES

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Abstract. In this paper a general fixed point theorem for mappings satisfying an implicit relation is proved. This result generalize Theorem 2.2 [1]. In the last part of the paper we prove that these mappings satisfy property (P).

REFERENCES

[1] M. Asadi, E. Karpinar and P. Salimi: *A new approach to G-metric and related fixed point theorems*, J. Inequal. Appl., 2013, 2013:454.
[2] R. Chung, T. Radian, A. Ravi and B.E. Rhoades: *Property (P) in G-metric spaces*, Fixed Point Theory Appl., 2010, Article ID 461684.
[3] B.C. Dhage: *Generalized metric spaces and mappings with fixed point*, Bull. Calcutta Math. Soc., **84**(1992), 329-336.
[4] B.C. Dhage: *Generalized metric spaces and topological structures I*, An. Ştiinţ. Univ. Al. I. Cuza Iaşi. Mat. (N.S.), **46**(2000), No. 1, 3-24.
[5] G.S. Jeong: *More maps for which $F(T) = F(T^n)$*, Demonstratio Math., **40**(2007), No. 3, 671-680.
[6] G.S. Jeong and B.E. Rhoades: *Maps for which $F(T) = F(T^n)$*, Fixed Point Theory Appl., **6**(2007), No. 3, 71-105.
[7] S.K. Mohanta: *Some fixed point theorems in G-metric spaces*, An. Ştiinţ. Univ. "Ovidius" Constanţa Ser. Mat., **20**(2012), No. 1, 285-306.
[8] Z. Mustafa and B. Sims: *Some remarks concerning D-metric spaces*, Intern. Conf. Fixed Point Theory Appl., Yokohama, (2004), 184-198.
[9] Z. Mustafa and B. Sims: *A new approach to generalized metric spaces*, J. Nonlinear Convex Anal., **7**(2006), 289-297.
[10] Z. Mustafa, H. Obiedat and F. Awawdeh: *Some fixed point theorem for mapping on complete G-metric spaces*, Fixed Point Theory Appl., 2008, Article ID 189870.
[11] Z. Mustafa, W. Shatanawi and M. Bataineh: *Fixed point theorems on uncomplete G-metric spaces*, J. Math. Stat., **4**(2008), No. 4, 196-201.
[12] Z. Mustafa and B. Sims: *Fixed point theorems for contractive mappings in complete G-metric spaces*, Fixed Point Theory Appl., 2009, Article ID 917175.
[13] Z. Mustafa, W. Shatanawi and M. Bataineh: *Existence of fixed point results in G-metric spaces*, Int. J. Math. Math. Sci., 2009, Article ID 283028.
[14] Z. Mustafa and H. Obiedat: *A fixed point theorem of Reich in G-metric spaces*, Cubo, **12**(2010), No. 1, 83-93.
[15] Z. Mustafa, M. Khandagji and W. Shatanawi: *Fixed point results on complete G-metric spaces*, Studia Sci. Math. Hungar., **48**(2011), No. 3, 304-319.

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[16] V. Popa: *Fixed point theorems for implicit contractive mappings*, Stud. Cercet. Ştiinţ., Ser. Mat., Univ. Bacău **7**(1997), 129-133.
[17] V. Popa: *Some fixed point theorems for compatible mappings satisfying an implicit relation*, Demonstratio Math., **32**(1999), 157-163.
[18] V. Popa: *A general fixed point theorem for several mappings in G-metric spaces*, Sci. Stud. Res. Ser. Math. Inform., **21**(2011), No. 1, 205-214.
[19] V. Popa and A.-M. Patriciu: *A general fixed point theorem for mappings satisfying an ϕ-implicit relation in complete G-metric spaces*, Gazi Univ. J. Sci., **25**(2012), No. 2, 403-408.
[20] V. Popa and A.-M. Patriciu: *A general fixed point theorem for pair of weakly compatible mappings in G-metric spaces*, J. Nonlinear Sci. Appl., **5**(2012), 151-160.
[21] B.E. Rhoades and M. Abbas: *Maps satisfying contractive conditions of integral type for which $F(T) = F(T^n)$*, Int. J. Pure Appl. Math., **45**(2008), 225-231.
[22] W. Shatanawi: *Fixed point theory for contractive mappings satisfying φ-maps in G-metric spaces*, Fixed Point Theory Appl., 2010, Article ID 181650.

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