A COINCIDENCE AND FIXED POINT THEOREMS FOR SEMI-QUASI CONTRACTIONS

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Abstract. In this paper, we introduce the notion of semi-quasi contraction and obtain coincidence and common fixed point theorems for such contractions without using any kind of continuity of mappings. Besides addressing an open question, our results extend and generalize some well known fixed point theorems including Ćirić's quasi contraction theorem.
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References

[1] Lj. B. Ćirić, *A generalization of Banach's contraction principle*, Proc. Amer. Math. Soc., **45**(1974), 267-273.

[2] K.M. Das, K.V. Naik, *Common fixed point theorems for commuting maps on a metric space*, Proc. Amer. Math. Soc. **77**(1979), 369-373.

[3] S. Dhompongsa, H. Yingtaweesittikul, *Fixed points for multivalued mappings and metric completeness*, Fixed Point Theory and Appl., (2009), Art. ID 972395, 15 pp.

[4] D. Doric, R. Lazovic, *Some Suzuki-type fixed point theorems for generalized multivalued mappings and applications*, Fixed Point Theory Appl. 2011, 2011:40, 8 pp.

[5] K. Goebel, *A coincidence theorem*, Bull. Acad. Polon. Sci. Sr. Sci. Math. Astronom. Phys., **16**(1968), 733-735.

[6] S. Itoh, W. Takahashi, *Single valued mappings, mutivalued mappings and fixed point theorems*, J. Math. Anal. Appl., **59**(1977), 514-521.

[7] G. Jungck, *Commuting mappings and fixed points*, Amer. Math. Monthly., **83**(1976), 261-263.

[8] G. Jungck, B.E. Rhoades, *Fixed points for set-valued functions without continuity*, Indian J. Pure Appl. Math., **29**(3)(1988), 227-238.

[9] M. Kikkawa, T. Suzuki, *Three fixed point theorems for generalized contractions with constants in complete metric spaces*, Nonlinear Anal., **69**(2008), 2942-2949.

[10] M. Kikkawa, T. Suzuki, *Some similarity between contractions and Kanannan mappings*, Fixed Point Theory and Appl., (2008), Art. ID 649749, 8 pp.

[11] O. Popescu, *Two fixed point theorems for generalized contractions with contants in complete metric space*, Cent. Eur. J. Math., **7**(3)(2009), 529-538.

[12] O. Popescu, *Two generalizations of some fixed point theorems*, Comput. Math. Appl., **62**(2011), no. 10, 3912–3919.

[13] G. Moţ, A. Petruşel, *Fixed point theory for a new type of contrative multivalued operators*, Nonlinear Anal., **70**(2009), 3371-3377.

[14] S. Ranganathan, *A fixed point theorem for commuting mappings*, Math. Sem. Notes Kobe Univ., **6**(1978), 351-357.

[15] B.E. Rhoades, *A comparison of various definitions of contractive mappings*, Trans. Amer. Math. Soc., **226**(1977), 257–290.

[16] S.L. Singh, S.N. Mishra, *Coincidence and fixed points of nonself hybrid contractions*, J. Math. Anal. Appl., **256**(2001), 486-497.

[17] S.L. Singh, H.K. Pathak, S.N. Mishra, *On a Suzuki type general fixed point theorem with applications*, Fixed Point Theory and Appl., (2010), Art. ID 234717, 15 pp.

[18] S.L. Singh, S.N. Mishra, Renu Chugh, Raj Kamal, *General Common Fixed Point Theorems and Applications*, J. Appl. Math., (2012), Art. ID 902312, 14 pp.

[19] T. Suzuki, *A generalized Banach contration principle that characterizes metric completeness*, Proc. Amer. Math. Soc., **136**(2007), no. 5, 1861-1869.