FUNCTIONS WITH STRONGLY β-θ-CLOSED GRAPHS

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Abstract. In this paper, by the use of β-open [1] sets, the notion of functions having strongly β-θ-closed graphs is being initiated. Several characterizations and basic properties of it are investigated. Important applications of this investigation are exhibited by establishing a new characterization of the concept β-closedness [7] and a sufficient condition for common fixed points of a family of functions having strongly β-θ-closed graphs.

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REFERENCES

[1] Abd. El-Monsef, M.E., El-Deeb, S.N. and Mahmoudnd, R.A., *β-open sets and β-continuous mappings*, Bull. Fac. Sci. Assiut Univ., **12** (1983), 77–90.

[2] Abd. El-Monsef, M.E. and Kozae, A.M., *Some generalized forms of compactness and closedness*, Delta J. Sci., **9** (1985), 257–269.

[3] Aho, T. and Nieminen, T., *Spaces in which preopen subsets are semi-open*, Ricerche Mat., **43** (1994), 45–59.

[4] Andrijević, D., *Semi-preopen sets*, Mat. Vesnik, **38** (1986), 24–32.

[5] Andrijević, D., *On SPO-equivalent topologies*, Rend. Circ. Mat. Palermo (2) Suppl., **29** (1992), 317–328.

[6] Andrijević, D., *On b-open sets*, Mat. Vesnik, **48** (1996), 59–64.

[7] Basu, C.K. and Ghosh, M.K., *β-closed spaces and β-θ-subclosed graphs*, Eur. J. Pure Appl. Math., **1** (2008), 40–50.

[8] Basu, C.K. and Ghosh, M.K., *Non-continuous functions associated with a covering property defined by β-open sets*, (Submitted).

[9] Beceren, Y. and Noiri, T., *Some functions defined by semi-open and β-open sets*, Chaos Solitons Fractals, **36** (2008), 1225–1231.

[10] Bourbaki, N., *General Topology*, Addition-Wesley, Reading, Mass, 1966.

[11] Caldas, M. and Jafari, S., *Some propertires of contra β-continuous functions*, Mem. Fac. Sci. Kochi Univ. Ser. A Math., **22** (2001), 19–28.

[12] Caldas, M. and Jafari, S., *A new decomposition of β-open functions*, Chaos Solitons Fractals, **40** (2009), 10–12.

[13] Duszyński, Z., *On some concepts of weak connectedness of topological spaces*, Acta. Math. Hungar., **110** (2006), 81–90.

[14] Ekici, E., *A note on almost β-continuous functions*, Chaos Solitons Fractals, **41** (2009), 1010–1013.

[15] Ganster, M. and Andrijević, D., *On some questions concerning semi-preopen sets*, J. Inst. Math. Comput. Sci. Math. Ser., **1** (1988), 65–75.

[16] HALVAC, T.H., *Relations between new topologies odtained from old ones*, Acta Math. Hungar., **64** (1994), 231–235.

[17] JAFARI, S. and NOIRI, T., *Properties of β-connected spaces*, Acta Math. Hungar., **101** (2003), 227–236.

[18] JOSEPH, J.E. and KWACK, M.H., *On S-closed spaces*, Proc. Amer. Math. Soc., **80** (1980), 341–348.

[19] LEVINE, N., *Semi-open sets and semi-continuity in topological spaces*, Amer. Math. Monthly, **70** (1963), 36–41.

[20] MAHMOUD, R.A. and ABD EL-MONSEF, M.E., *β-irressolute and β-topological invariants*, Proc. Pakistan Acad. Sci, **27** (1990), 285–296.

[21] MASHHOUR, A.S., ABD EL-MONSEF, M.E. and EL-DEEB, S.N., *On precontinuous and weak precontinuous mappings*, Proc. Math. Phys. Soc. Egypt, **53** (1982), 47–53.

[22] NJÅSTAD, O., *On some classes of nearly open sets*, Pacific J. Math., **15** (1965), 961–970.

[23] NOIRI, T., *Weak and strong forms of β-irressolute functions*, Acta Math. Hungar., **99** (2003), 315–328.

[24] POPA, V. and NOIRI, T., *On β-continuous functions*, Real Anal. Exchange, **18** (1992-1993), 544–548.

[25] POPA, V. and NOIRI, T., *Weakly β-continuous functions*, An. Univ. Timisoara Ser. Mat. Inform., **32** (1994), 83–92.

[26] POPA, V. and NOIRI, T., *On upper and lower β-continuous multifunctions*, Real Anal. Exchange, **22 (1)** (1996-1997), 362–376.

[27] TAHILIANI, S., *A study of some spaces related to β-open sets*, Note Mat., **27** (2007), 145–152.

[28] ZORLUTUNA, I., *On strong forms of completely irressolute functions*, Chaos Solitons Fractals, **38** (2008), 970–979.

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