ORDER-CLUSTERED FIXED POINT THEOREMS AND THEIR APPLICATIONS TO PARETO EQUILIBRIUM PROBLEMS

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Abstract. In this paper, we provide some properties of order clusters in preordered sets and we prove some order-clustered fixed point theorems on preordered sets. Then by applying these theorems, we show the existence of ordered Pareto equilibrium and Nash equilibrium for some noncooperative strategic games with incomplete (preordered) preferences.

Key Words and Phrases: Chain-complete preordered sets, order-clustered fixed point, fixed point, Pareto equilibrium, Nash equilibrium.

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References


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