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The collection contains abstracts of papers accepted for the Fifth International Conference Game Theory and Management (June 27–29, 2011, St. Petersburg University, St. Petersburg, Russia). The presented abstracts belong to the field of game theory and its applications to management.

The abstract volume may be recommended for researches and post-graduate students of management, economic and applied mathematics departments.

Computer design: Tatyana Grigorova and Andrew Zyatchin

ТЕОРИЯ ИГР И МЕНЕДЖМЕНТ. Сб. тезисов 5-ой международной конференции по теории игр и менеджменту / Под ред. Л.А. Петросяна и Н.А. Зенкевича. – СПб.: Высшая школа менеджмента СПбГУ, 2011. – 268 с.

Сборник содержит тезисы докладов участников 5-ой международной конференции по теории игр и менеджменту (27–29 июня 2011 года, Высшая школа менеджмента, Санкт-Петербургский государственный университет, Санкт-Петербург, Россия). Представленные тезисы относятся к теории игр и её приложениям в менеджменте.

Тезисы представляют интерес для научных работников, аспирантов и студентов старших курсов университетов, специализирующихся по менеджменту, экономике и прикладной математике.

Компьютерная верстка: Т.В. Григорова и А.В. Зятчин

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Necessary and Sufficient Conditions for the Existence of Inclusion Map of Game with Preference Relations into Game with Payoff Functions

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Keywords: *Game with preference relations, Strict homomorphism, Inclusion map, Game with payoff functions*

Let K be a class of games with preference relations, $\mathcal{K}$ be a class of games with payoff functions. We consider game $G \in \mathrm{K}$ in the form

$$G = \langle (X_i)_{i\in N}, A, (\rho_i)_{i\in N}, F \rangle$$

where $N = \{1,\ldots,n\}$ is a set of players, X_i is a set of *strategies* of player i, A is a set of *outcomes*, $\rho_i \subseteq A^2$ is a preference relation of player $i (i \in N)$ and realization function F is a mapping of set of *situations* $X = X_1 \times \ldots \times X_n$ in set of outcomes A.

Game $\Gamma \in \mathcal{K}$ is given in the normal form

$$\Gamma = \langle (X_i)_{i\in N}, (\lambda_i)_{i\in N} \rangle$$

where λ_i is a payoff function of player i.

The concept of homomorphism from game G into game Γ is introduced by analogy with concept of homomorphism for games of class K ([1]).

Homomorphism from game G into game Γ can be define as a n-tuple of mappings $f = (\psi_i)_{i\in N}$, where $\psi_i : A \to \mathbb{R}$, such that for each $i \in N$ the following condition

$$a_1 \overset{\rho_i}{\lesssim} a_2 \Rightarrow \psi_i(a_1) \le \psi_i(a_2)$$

holds;

homomorphism will be strict if and only if for each $i \in N$ the condition

$$a_1 \overset{\rho_i}{<} a_2 \Rightarrow \psi_i(a_1) < \psi_i(a_2)$$

is satisfied;

homomorphism will be reciprocal if and only if for each $i \in N$ the following condition

$$a_1 \overset{\rho_i}{\lesssim} a_2 \Leftrightarrow \psi_i(a_1) \leq \psi_i(a_2)$$

holds.

Strict homomorphism f from game G into some game Γ is called *inclusion map* of game G into class $\mathcal{K}$.

Reciprocal homomorphism f from game G into some game Γ is called *isomorphic* inclusion map of game G into class $\mathcal{K}$.

Consider several elementary properties of inclusion map.

1. If there exists isomorphic inclusion map of game G into game Γ then game G is game with linear and transitive preference structure.
2. Any inclusion map of game with linear preference structure into game with payoff functions is isomorphic.

The main result of this paper is the following theorem.

There exists inclusion map of finite game G into class $\mathcal{K}$ if and only if for each $i(i \in N)$ preference relation ρ_i is aciclic under its symmetric part ρ_i^s.

References

[1] Savina, T.F. (2010). Homomorphisms and Congruence Relations for Games with Preference Relations. Contributions to game theory and management. Vol. III. Collected papers on the Third International Conference Game Theory and Management. SPb.: Graduate School of Management SPbU, pp. 387–398

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