Ministry of Education and Training
Vinh University

SOCIALIST REPUBLIC OF VIETNAM
Independence-Freedom-Happiness

SUMMARY INFORMATION OF THE DOCTORAL THESIS

1. Summary:

Full name of the doctoral student: Duong Xuan Giap

Thesis Title: The ergodic theorems and the strong law of large numbers for array of random sets

Specialty: Theory of Probability and Mathematical Statistics

Code: 62. 46. 01. 06

Training Institution: Vinh University.

2. Main contents:

2.1. Objective and subject of the research

The thesis studies: the multidimensional Birkhoff's ergodic theorem, the strong laws of large numbers for double array and triangular array of random sets with several conditions.

2.2. Methodology of the research

We use theoretical research method belonging to the areas: probability theory, convex analysis and functional analysis. Technically, we use convexication technique, types of Stolz's theorem, etc.

2.3. Main results and conclusion

- Establish some results of convergence for multi-indexed array of closed subsets of a Banach space, and for multi-indices array of random sets.
- Establish the multidimensional Birkhoff's ergodic theorem for separable real Banach space-valued random variables.
- Establish the two-dimensional multi-valued Birkhoff's ergodic theorem with respect to Mosco convergence and Wijsman convergence.
- Establish the strong law of large numbers for multi-indexed array of 2-exchangeable random elements.

- Establish the strong laws of large numbers on Mosco convergence and Wijsman convergence for double array of random sets with the cases: p.i.i.d, or independent and taking closed-values in Rademacher type p Banach space, or 2-exchangeable.

- Establish the strong law of large numbers for triangular array of rowwise independent random sets taking closed-values in Rademacher type p Banach space with respect to Mosco convergence and Wijsman convergence.

Nghe An, March 16, 2016

Supervisor	**Doctoral student**
Prof. Dr. Nguyen Van Quang	Duong Xuan Giap