



One-solely balanced sets and related Steiner trades

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Abstract

A μ -way t -solely balanced set is a μ -way (v, k, t) Steiner trade $T = \{T_1, T_2, \dots, T_\mu\}$ such that T_i and T_j ($1 \leq i < j \leq \mu$) Contains no common $(t + 1)$ -subset. The one-solely sets are the most important tool for building Steiner trades. In this article we introduce some techniques for construction the one-solely sets and related Steiner trades.

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1 Introduction

The concept of trade has represented in the graph theory, design theory and latin square. In this paper we investigate this concept in design theory. This subject is originated in the 1960s by Hedayat [3]. The concept of trade was introduced in 1916 by Cole and Cumming in other forms. This concept have been generated in [4] recently, as μ -way (v, k, t) trade $\mu \geq 2$.

Definition 1.1. A μ -way (v, k, t) trade of volume m consists of μ disjoint collections $\{T_1, T_2, \dots, T_\mu\}$ each of m blocks, such that for every t -subset of v -set V , the number of blocks containing this t -subset is the same in each T_i ($1 \leq i \leq \mu$). In the other words any pair of T_i 's is a (v, k, t) trade of volume m .

A μ -way (v, k, t) trade is called μ -way (v, k, t) Steiner trade if any t -subset of found(T) occurs at most once in $T_1(T_j, j \geq 2)$.

Definition 1.2. Let $T = \{T_1, T_2, \dots, T_\mu\}$ be a μ -way (v, k, t) Steiner trade. We say T is μ -way (v, k) t -solely balanced if T_i and T_j ($1 \leq i < j \leq \mu$) contain no common $(t + 1)$ subset.

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