STEINER TRIPLE SYSTEM IN HIGHER ORDER

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Combinatorics could be described as the art of arranging objects according to specified rules. We want to know whether a particular arrangement is possible at all, and if so, the number of ways by which it can be done. If the rules are simple (like picking a cricket team from a class of schoolboys), the existence of an arrangement is clear, and we concentrate on the counting problem. But for more involved rules, it may not be clear whether the arrangement is possible at all, for example, Kirkmans's schoolgirls' problem.

The main objective of this project is to construct Steiner Triple System of higher order, which could be used to solve many combinatorics problems.

A pair (X, B), where X is an n-set and B is a family of m-subsets of X, such that any l-set lies in almost one member of B is called Steiner system S (l, m, n).

S (2, 3, n) is called the Steiner Triple System and is denoted by STS (n). We construct Steiner triple system for higher order n.

For these constructions, we use difference sets, block designs, quadratic residues and orbits. Both graphical and recursive construction are given in our work and we have shown that the recursive construction method can be used to construct higher order Steiner Triple Systems.