IPM Combinatorics II: Design Theory, Graph Theory, and Computational Methods
April 22-27, 2006, IPM, Tehran

Construction and Classification of Combinatorial Designs by Computer Search

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The existence (classification) of combinatorial objects with certain properties is a central problem in combinatorics. In many cases computer search seems to be the sole approach to the problem. In the last decades the improvements in existing algorithms and the appearance of new methods along with new generations of computers have resulted in numerous computational achievements. In this talk, we review some of these methods in the construction of combinatorial designs. The objects of interest include block designs, orthogonal designs, Hadamard matrices, Williamson matrices, complementary sequences and so on. We also present new results on the classification of triple systems.