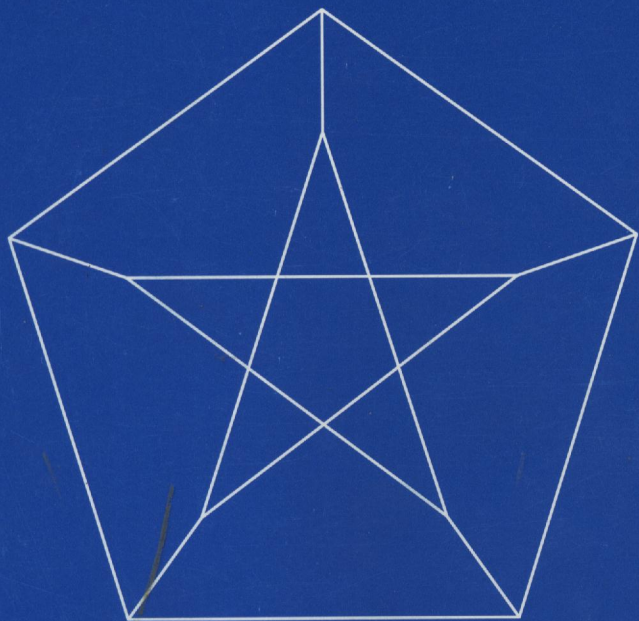


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Contents

Contributions

- R.J.R. Abel and B. Du*
The existence of three idempotent IMOLS 1
- N. Alon, G. Fertin, A.L. Liestman, T.C. Shermer and L. Stacho*
Factor d -domatic colorings of graphs 17
- S. Bau and M.A. Henning*
Matching transformation graphs of cubic bipartite plane graphs 27
- K. Betsumiya, S. Georgiou, T.A. Gulliver, M. Harada and C. Koukouvinos*
On self-dual codes over some prime fields 37
- A. Brodsky, S. Durocher and E. Gethner*
Toward the rectilinear crossing number of K_n : new drawings, upper bounds, and asymptotics 59
- W. Broughton and G. McGuire*
On the non-existence of quasi-3 designs 79
- C.-Y. Chou, W. Wang and Xuding Zhu*
Relaxed game chromatic number of graphs 89
- P. Damaschke*
Linear-time recognition of bipartite graphs plus two edges 99
- P. Dankelmann and R.C. Laskar*
Factor domination and minimum degree 113
- T. Dvořák, I. Havel and M. Mollard*
On paths and cycles dominating hypercubes 121
- O. Favaron, G.H. Fricke, D. Pritikin and J. Puech*
Irredundance and domination in kings graphs 131
- H.A. Harutyunyan and A.L. Liestman*
On the monotonicity of the broadcast function 149
- T.W. Haynes, S.T. Hedetniemi, M.A. Henning and P.J. Slater*
 H -forming sets in graphs 159
- Y. Huang*
Maximum genus of a graph in terms of its embedding properties 171
- D.S. Kim and J.G. Lee*
A MacWilliams-type identity for linear codes on weak order 181

<i>M. Matamala</i>		
Constructibility of speed one signal on cellular automata	_____	195
<i>E.W. McMahon, B.A. Shimkus and J.A. Wolfson</i>		
Chordal graphs and the characteristic polynomial	_____	211
<i>I.G. Perepelitsa</i>		
Bounds on the chromatic number of intersection graphs of sets in the plane	_____	221
<i>M.A. Pizaña</i>		
The icosahedron is clique divergent	_____	229
<i>C.D. Savage, I. Shields and D.B. West</i>		
On the existence of Hamiltonian paths in the cover graph of $M(n)$	_____	241
<i>Z.-W. Sun</i>		
General congruences for Bernoulli polynomials	_____	253
Author index to volume 262	_____	277

Abstract

In this paper it is shown that an idempotent $TD(m, n) - TD(5, n)$ exists whenever the known necessary condition $m \geq 4n+1$ is satisfied, except when $(m, n) = (6, 1)$ and possible when $(m, n) = (10, 1)$. For $m \leq 60$ and $n \leq 10$, we also indicate where several idempotent $TD(k, m) - TD(k, n)$'s for $k = 0, 1, 2$ can be found.

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Keywords: Transversal design; incomplete transversal design; idempotent incomplete transversal design; quasidifference matrix; Orthogonal latin squares; incomplete orthogonal latin square

1. Introduction

Let v and h_i , $i=1, \dots, n$, be positive integers. An *incomplete transversal design* (ITD): $TD(k, v) - \sum_{1 \leq i \leq n} TD(k, h_i)$ is a quadruple $(X, \mathcal{G}, \mathcal{B}, \mathcal{H})$ satisfying the following conditions:

1. X is a set of kv elements called points and $\mathcal{G} = \{G_1, G_2, \dots, G_n\}$ is a partition of X into k disjoint v -element subsets called groups.
2. \mathcal{B} is a collection of k -element subsets of X called blocks, each containing one element from each G_i .
3. $\mathcal{H} = \{H_1, H_2, \dots, H_n\}$ is a collection of disjoint subsets of X (called holes) and H_i contains h_i elements from each group G_i .

CONTENTS
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