Finite Fields and Their Applications 62 (2020) 101620

Contents lists available at ScienceDirect

Finite Fields and Their Applications

www.elsevier.com/locate/ffa

MDS and I-perfect poset block codes

B.K. Dass [a], Namita Sharma [a,*], Rashmi Verma [b]

[a] Department of Mathematics, University of Delhi, Delhi, 110 007, India
[b] Maia Sundri College for Women, University of Delhi, Maia Sundri Lane, Delhi, 110 002, India

ARTICLE INFO

Article history:
Received 3 March 2018
Received in revised form 24 October 2019
Accepted 11 November 2019
Available online xxxx
Communicated by James W.P. Hirschfeld

MSC:
94B05
94B75

Keywords:
Maximum distance separable code
Poset block metric
Perfect code

ABSTRACT

We obtain the Singleton bound for poset block codes and define a maximum distance separable poset block code (MDS (P,π)-code) as a code meeting this bound. We extend the concept of I-balls to poset block metric and describe r-perfect and MDS (P,π)-codes in terms of I-perfect codes. As a special case when all the blocks have the same dimension, we establish that MDS (P,π)-codes are same as I-perfect codes for $I \in T^{\frac{n}{n_1}}(P)$. We show that the duality result also holds for this case. Further, we determine the weight enumerator of an MDS (P,π)-code.

1. Introduction

One of the important aspects of coding theory is to construct codes capable of correcting various errors that occur frequently in communication channels. Since the error correction capability of a code is best determined in terms of its minimum distance,

* Corresponding author.
E-mail addresses: dassbk@rediffmail.com (B.K. Dass), namita01sharma@gmail.com (N. Sharma), rashmiv7108@gmail.com (R. Verma).

https://doi.org/10.1016/j.ffa.2019.101620
1071-5797/