THE EXISTENCE OF QUASI REGULAR AND BI-REGULAR SELF-COMPLEMENTARY 3-UNIFORM HYPERGRAPHS

LATA N. KAMBLE
Department of Mathematics
Abasaheb Garware College,
Kurve Road, Pune-411004
e-mail: lata7429@gmail.com

CHARUSHEELA M. DESHPANDE

AND

BHAGYASHREE Y. BAM
Department of Mathematics
College of Engineering Pune
Pune-411006
e-mail: dcm.maths@coep.ac.in

Abstract

A k-uniform hypergraph \( H = (V; E) \) is called self-complementary if there is a permutation \( \sigma : V \to V \), called a complementing permutation, such that for every \( k \)-subset \( e \) of \( V \), \( e \in E \) if and only if \( \sigma(e) \notin E \). In other words, \( H \) is isomorphic with \( H' = (V; V^{(k)} - E) \). In this paper we define a bi-regular hypergraph and prove that there exists a bi-regular self-complementary 3-uniform hypergraph on \( n \) vertices if and only if \( n \) is congruent to 0 or 2 modulo 4. We also prove that there exists a quasi regular self-complementary 3-uniform hypergraph on \( n \) vertices if and only if \( n \) is congruent to 0 modulo 4.

Keywords: self-complementary hypergraph, uniform hypergraph, regular hypergraph, quasi regular hypergraph, bi-regular hypergraph.

2010 Mathematics Subject Classification: 05C65.

References


Received 24 November 2014
Revised 1 August 2015
Accepted 1 August 2015