

PBIB-DESIGNS AND ASSOCIATION SCHEMES FROM
MINIMUM SPLIT DOMINATING SETS OF CERTAIN
JUMP SIZES OF CIRCULANT GRAPHS

V. R. Kulli¹, B. Chaluvvaraju² and M. Kumara²

¹Department of Mathematics,
Gulbarga University, Gulbarga-585106, INDIA
E-mail: vrkulli@gmail.com

²Department of Mathematics,
Bangalore University,
Jnana Bharathi Campus, Bengaluru -560 056, INDIA.
E-mail: bchaluvvaraju@gmail.com, kumarabub@gmail.com

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Abstract: A dominating set D of a graph $G = (V, E)$ is a split dominating set if the induced subgraph $\langle V - D \rangle$ is disconnected. The split domination number $\gamma_s(G)$ is the minimum cardinality of a split dominating set of G . The set of vertices is a γ_s -set if it is split dominating set with $\gamma_s(G)$. In this paper, we obtain the total number of γ_s -sets, the Partially Balanced Incomplete Block (PBIB)-Designs on γ_s -sets of certain jump sizes of Circulant graphs with m -association schemes for $1 \leq m \leq \lfloor \frac{p}{2} \rfloor$.

Keywords and Phrases: Association schemes; PBIB Designs; Split Dominating sets; Circulant graph.

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1. Introduction

All graphs considered here are finite, undirected and connected with no loops and multiple edges. As usual $p = |V|$ and $q = |E|$ denote the number of vertices and edges of a graph G , respectively. For additional definitions and notations, the reader may refer to [7] and [11].

For a given positive integer p , let $s_1, s_2, \dots, s_t$ be a sequence of integers where $0 < s_1 < s_2 < \dots < s_t < \frac{p+1}{2}$. The Circulant graph $C_p(S)$ where $S = \{s_1, s_2, \dots, s_t\}$