

3-Group divisible designs with block size 4 and 2 groups

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One of the main problems in design theory is to find construction methods to obtain unknown designs. In this paper we give fundamental constructions of group divisible SBS designs with block size 4 and 2 groups. We give necessary conditions for their existence and prove that these conditions are sufficient. We use tools from graph theory and finite fields, for example-designs, Steiner quadruple systems (SQSs), 1 and 2-factorisations of complete graphs.

Keywords: Group divisible designs; t-designs; 1- and 2- factorization; Steiner quadruple system (SQS).