Original Articles

Generalized Steiner Triple systems with Group Size g≡0, 3 (mod 6)

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摘要   Generalized Steiner triple systems, (GS(2,3,n,g), are equivalent to maximum constant weight codes over an alphabet of size g+1 with distance 3 and weight 3 in which each codeword has length n. The necessary conditions for the existence of a GS(2,3,n,g) are (nm1)gL0 (mod 2), n(nm1)g~2≡0 (mod 6), and n≥g+2. These necessary conditions are shown to be sufficient by several authors for 2≤g≤11. In this paper, three new results are obtained. First, it is shown that for any given g, gL0 (mod 6) and g≥12, if there exists a GS(2,3,n,g) for all n, g+2≤n≤7g+13, then the necessary conditions are also sufficient. Next, it is also shown that for any given g, gL3 (mod 6) and g≥15, if there exists a GS(2,3,n,g) for all n, nL1 (mod 2) and g+2≤n≤7g+6, then the necessary conditions are also sufficient. Finally, as an application, it is proved that the necessary conditions for the existence of a GS(2,3,n,g) are also sufficient for g=12,15.

关键词   generalized steiner triple system   constant weight codes

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