Explicit Expression for Primitive Idempotents of Some Cyclic Codes and Corresponding Codes

Jagbir Singh

Department of Mathematics, M.D. University, Rohtak, India

S.K. Arora

Department of Mathematics, M.D. University, Rohtak, India

Abstract:

Let *F* be a finite field of prime power order *q,* where *q* is of the form 8 3 *k*+. If *q* is primitive root modulo p^n, then the semi-simple group algebra *FG* of the cyclic group *G* of order 8 p^n over *F*, where *p* is an odd prime and $n \geq 1$, has 8 *n*+ 5 primitive idempotents. Explicit expressions for these primitive idempotents are obtained. Generating polynomials, minimum distances and dimensions of the corresponding minimal cyclic codes are also obtained.

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Group algebra, primitive idempotents, cyclotomic cosets, generating polynomial.