

1030-94-385

Hai Q Dinh* (hdinh@kent.edu), Department of Mathematical Sciences, Kent State University, 4314 Mahoning Avenue, Warren, OH 44483. *Constacyclic Codes over Galois Extension Rings of $\mathbb{F}_2 + u\mathbb{F}_2$.*

There are four finite rings of four elements, namely, the Galois field \mathbb{F}_4 , the ring of integers modulo four \mathbb{Z}_4 , the ring $\mathbb{F}_2 + u\mathbb{F}_2$ where $u^2 = 0$, and the ring $\mathbb{F}_2 + v\mathbb{F}_2$ where $v^2 = v$. The ring $\mathcal{R} = \mathbb{F}_2 + u\mathbb{F}_2$ lies between \mathbb{F}_4 and \mathbb{Z}_4 , in the sense that it is additively analogous to \mathbb{F}_4 , and multiplicatively analogous to \mathbb{Z}_4 . In this talk, we study some classes of constacyclic codes of length 2^s over Galois extension rings of the ring \mathcal{R} . The structure and Hamming distances of \bar{u} -constacyclic codes are established. We classify all cyclic codes of length 2^s over such Galois extension rings, and obtain a formula for the number of those cyclic codes, as well as the number of codewords in each code. (Received August 07, 2007)