

CONTENTS

	Page
PREFACE	xiii
CHAPTER 1. A SURVEY OF SOME FINITE FIELD THEORY	
1.1. Introduction.....	1
1.2. Finite Fields.....	1
1.3. Finite Extensions and Irreducible Polynomials.....	6
1.4. Polynomial Representation of Functions on a Finite Field.....	11
CHAPTER 2. ALGEBRAIC EXTENSIONS OF FINITE FIELDS	
2.1. Introduction.....	21
2.2. The Algebraic Closure of a Finite Field.....	22
2.3. Subfields of the Algebraic Closure.....	23
2.4. Automorphisms of Subfields of the Algebraic Closure.....	31
CHAPTER 3. ITERATED PRESENTATIONS AND EXPLICIT BASES	
3.1. Introduction.....	37
3.2. Definitions of Iterated Presentation and Explicit Basis	39
3.3. Iterated Presentations of the Fields $GF(p^{p^\infty})$	44
3.4. Iterated Presentations of the Fields $GF(q^{(p-1)p^\infty})$, $p \wedge q = 1$	49
3.5. Several Additional Iterated Presentations.....	57
CHAPTER 4. POLYNOMIALS AND POLYNOMIAL FUNCTIONS	
4.1. Introduction.....	61
4.2. Irreducible Polynomials over $GF(q^N)$	62
4.3. Permutation Monomials on $GF(q^N)$	68
4.4. Permutation q -Polynomials on $GF(q^N)$	73
4.5. Dickson Polynomials over $GF(q^N)$	79
4.6. Representation of Functions of $GF(q^N)$	81
4.7. Representation of Linear Transformations on $GF(q^N)$	84

CHAPTER 5. TWO APPLICATIONS

5.1. Introduction.....	87
5.2. Orthogonal Latin Squares.....	88
5.3. Permutation Polynomials on the Matrices over $GF(q^N)$	92

BIBLIOGRAPHY.....	101
-------------------	-----