

CONTENTS

Logical Chart	xvi
Introduction	1
Preliminaries	1
Field Theory	3
Ideals and Varieties	19
Algorithms	40
Characteristic Sets	46
CHAPTER 1	
Difference Rings and Difference Fields	
Definitions	57
Examples	58
CHAPTER 2	
Relations Among Difference Rings	
Difference Ring Extensions	63
Homomorphisms, Ideals, Solutions	70
Subrings of Special Elements	80
CHAPTER 3	
Ritt Difference Rings	
Preliminaries	82
Fundamental Theorems	84
Separation and Indecomposability	94
Complete Difference Ideals	98
CHAPTER 4	
Varieties of Difference Polynomials	
Definitions	109
Varieties and Ideals	110
Separated Varieties	116
CHAPTER 5	
Extensions of Difference Fields—Part I	
Transformal Dependence	118
Order and Effective Order	127
Limit Degree	135
Some Important Types of Extensions	143
Specialization	147

CHAPTER 6

Systems of Difference Equations—Part I

Difference Kernels	149
Realizations	155
The Variety of a Difference Polynomial	160
Singular and Multiple Realizations	181
Summary for One Difference Polynomial	193

CHAPTER 7

Extensions of Difference Fields—Part II

Compatibility and Replicability	196
Simple Extensions	201
Specialization	206
Babbitt's Decomposition	215
Compatibility—Improved Results	222
Specialization—Improved Results	227

CHAPTER 8

Systems of Difference Equations—Part II

Description of Varieties	236
Ground Field Extensions	243
Intersections of Difference Varieties	248
Algorithms	260
Linear Systems	269
Length of a Basis	273

CHAPTER 9

Isomorphisms of Difference Fields

Extensions of Isomorphisms	277
Automorphisms and Coordinate Extensions	279
Monadicity	295
Effect of Group and Ground Field	303

CHAPTER 10

The Variety of a Difference Polynomial

Introduction	310
ϕ -Series	314
The Low Weight Condition	324
Sufficient Conditions	332

Bibliography	345
---------------------------	------------

Index	349
--------------------	------------