

CONTENTS

PREFACE	PAGE vii
CHAPTER I	
ELEMENTARY DEFINITIONS	
1. Rings and fields	1
2. Elementary properties	7
3. Homomorphisms	13
4. Vector spaces	19
5. Polynomials	26
6. Higher polynomial rings; rational functions	35
Examples I	38
CHAPTER II	
EXTENSIONS OF FIELDS	
7. Elementary properties	41
8. Simple extensions	46
9. Algebraic extensions	51
10. Factorisation of polynomials	53
11. Splitting fields	61
12. Algebraically closed fields	67
13. Separable extensions	69
Examples II	79
CHAPTER III	
GALOIS THEORY	
14. Automorphisms of fields	82
15. Normal extensions	89
16. The fundamental theorem of Galois theory	100
17. Norms and traces	110
18. The primitive element theorem; Lagrange's theorem	113
19. Normal bases	118
Examples III	122

CONTENTS

CHAPTER IV
APPLICATIONS

	PAGE
20. Finite fields	125
21. Cyclotomic extensions	130
22. Cyclotomic extensions of the rational number field	134
23. Cyclic extensions	139
24. Wedderburn's theorem	145
25. Ruler-and-compasses constructions	149
26. Solution by radicals	160
27. Generic polynomials	168
Examples IV	173
READING LIST	175
INDEX OF NOTATIONS	176
INDEX	178