

Contents

| | |
|--|-------------|
| Editor's Statement | xiii |
| Section Editor's Foreword | xv |
| Preface | xvii |
| Historical Introduction | xxi |
| Prerequisites | xxv |
| Notation | xli |
| | |
| Chapter 1 Preliminaries on Fields and Polynomials | 1 |
| 1.1 Fields of Fractions | 1 |
| 1.2 The Characteristic | 5 |
| 1.3 Perfect Fields and Prime Fields | 10 |
| 1.4 Field Extensions | 13 |
| 1.5 Factorization of Polynomials | 18 |
| 1.6 Splitting of Polynomials | 29 |
| 1.7 Separable Polynomials | 34 |
| Notes | 39 |
| | |
| Chapter 2 Algebraic Extensions | 41 |
| 2.1 Algebraic Extensions | 41 |
| 2.2 Algebraically Closed Fields | 56 |
| 2.3 Normal Extensions | 64 |
| 2.4 Purely Inseparable Extensions | 74 |
| 2.5 Separable Extensions | 80 |
| Notes | 89 |

| | |
|--|------------|
| Chapter 3 Galois Theory | 92 |
| 3.1 Some Vector Spaces of Mappings of Fields | 92 |
| 3.2 The General Galois Correspondences | 98 |
| 3.3 Galois Extensions | 116 |
| 3.4 Finite Galois Theory | 120 |
| 3.5 Roots of Unity | 142 |
| 3.6 Primitive Elements | 154 |
| 3.7 Separable and Inseparable Degrees | 158 |
| 3.8 Norms and Traces | 162 |
| 3.9 Cyclic Extensions | 170 |
| 3.10 Solvability by Radicals | 180 |
| 3.11 Finite Fields | 188 |
| 3.12 Infinite Galois Theory | 196 |
| Notes | 208 |
| Chapter 4 Transcendental Extensions | 212 |
| 4.1 Dimensional Operators | 212 |
| 4.2 Transcendence Bases and Transcendence Degree | 219 |
| 4.3 Specializations and Places of Fields | 229 |
| 4.4 Separable Extensions | 242 |
| 4.5 Derivations of Fields | 253 |
| 4.6 Derivations of Algebraic Function Fields | 270 |
| Notes | 278 |
| References and Selected Bibliography | 281 |
| Index | 291 |