CONTENTS

vii

I. Preliminaries	
1. Definitions	1
2. Maps and Diagrams	6
3. The Most Important Types of Groups	14
4. Modules	19
5. Categories of Abelian Groups	21
6. Functorial Subgroups and Quotient Groups	25
7. Topologies in Groups	29
Notes	34
II. Direct Sums	
	26
8. Direct Sums and Direct Products 9. Direct Summands	36 46
, , <u>_ , , , , , , , , , , , , , , , , ,</u>	46 51
10. Pullback and Pushout Diagrams 11. Direct Limits	53
12. Inverse Limits	59
	65
13. Completeness and Completions Notes	70
110163	
	ix

Preface

x	CONTENTS
III. Direct Sums of Cyclic Groups	
14. Free Abelian Groups—Defining Relations	72
15. Finitely Generated Groups	77
16. Linear Independence and Rank17. Direct Sums of Cyclic <i>p</i>-Groups	83 87
18. Subgroups of Direct Sums of Cyclic Groups	87 91
19. Countable Free Groups	93
Notes	95
IV. Divisible Groups	
20. Divisibility	97
21. Injective Groups	99
22. Systems of Equations	101
23. The Structure of Divisible Groups	104
24. The Divisible Hull25. Finitely Cogenerated Groups	106 109
Notes	112
V. Pure Subgroups	
26. Purity	113
27. Bounded Pure Subgroups	117
28. Quotient Groups Modulo Pure Subgroups29. Pure-Exact Sequences	120 122
30. Pure-Projectivity and Pure-Injectivity	125
31. Generalizations of Purity	128
Notes	133
VI. Basic Subgroups	
32. p-Basic Subgroups	135
33. Basic Subgroups of p-Groups	139 143
34. Further Results on p-Basic Subgroups35. Different p-Basic Subgroups	147
36. Basic Subgroups Are Endomorphic Images	152
37. The Ulm Sequence	153
Notes	158
VII. Algebraically Compact Groups	
38. Algebraic Compactness	159
39. Complete Groups	162
40. The Structure of Algebraically Compact Groups	167

CONTENTS	хi
41. Pure-Essential Extensions42. More about Algebraically Compact Groups Notes	170 174 173
VIII. Homomorphism Groups	
 43. Groups of Homomorphisms 44. Exact Sequences for Hom 45. Certain Subgroups of Hom 46. Homomorphism Groups of Torsion Groups 47. Character Groups 48. Duality between Discrete Torsion and 0-Dimensional Compact Groups Notes 	180 184 188 193 199 203 207
IX. Groups of Extensions	
 49. Group Extensions 50. Extensions as Short Exact Sequences 51. Exact Sequences for Ext 52. Elementary Properties of Ext 53. The Functor Pext 54. Cotorsion Groups 55. The Structure of Cotorsion Groups 56. The Ulm Factors of Cotorsion Groups 57. Applications to Ext 58. Injective Properties of Cotorsion Groups Notes 	209 212 217 221 226 232 237 240 243 247 250
X. Tensor and Torsion Products	
 59. The Tensor Product 60. Exact Sequences for Tensor Products 61. The Structure of Tensor Products 62. The Torsion Product 63. Exact Sequences for Tor 64. The Structure of Torsion Products Notes 	252 257 261 264 268 271 274
Bibliography	275
Table of Notations	281
Author Index Subject Index	285 287