TABLE OF CONTENTS

	Page
CHAPTER 1. COMBINATORIAL GROUP THEORY	1
1.1 Free groups	1
1.2 Generators and relators	17
1.3 Free products	24
1.4 Pushouts and amalgamated free products	29
1.5 HNN extensions	34
CHAPTER 2. SPACES AND THEIR PATHS	49
2.1 Some point-set topology	49
2.2 Paths and homotopies	54
CHAPTER 3. GROUPOIDS	62
3.1 Groupoids	62
3.2 Direct limits	70
CHAPTER 4. THE FUNDAMENTAL GROUPOID AND THE FUNDAMENTAL GROUP	74
4.1 The fundamental groupoid and the fundamental group	74
4.2 Van Kampen's theorem	83
4.3 Covering spaces	96
4.4 The circle and the complex plane	101
4.5 Joins and weak joins	107
CHAPTER 5. COMPLEXES	113
5.1 Graphs	113
5.2 Complexes and their fundamental groups	121
5.3 Free groups and their automorphisms	132
5.4 Coverings of complexes	139
5.5 Subdivisions	146
5.6 Geometric realisations	149
CHAPTER 6. COVERINGS OF SPACES AND COMPLEXES	151

CHAPTER 7. COVERINGS AND GROUP THEORY 167

CHAPTER 8. BASS-SERRE THEORY 182
8.1 Trees and free groups 182
8.2 Nielsen's method 188
8.3 Graphs of groups 198
8.4 The structure theorems 204
8.5 Applications of the structure theorems 211
8.6 Construction of trees 233

CHAPTER 9. DECISION PROBLEMS 243
9.1 Decision problems in general 243
9.2 Some easy decision problems in groups 251
9.3 The word problem 254
9.4 Modular machines and unsolvable word problems 265
9.5 Some other unsolvable problems 268
9.6 Higman's embedding theorem 274
9.7 Groups with one relator 281

CHAPTER 10. FURTHER TOPICS 286
10.1 Small cancellation theory 286
10.2 Other topics 289

NOTES AND REFERENCES 291

BIBLIOGRAPHY 297

INDEX 306