

Contents

Chapter 0. Introduction.	1
0.1. Motivation.	1
0.2. Highlights of Chapter 1.	2
0.3. Highlights of Chapter 2.	3
0.4. Highlights of Chapter 3.	4
0.5. Highlights of Chapter 4.	5
0.6. Reading guide.	6
0.7. Acknowledgements.	6
Chapter 1. General properties of the ku -cohomology of finite groups.	7
1.1. Varieties for connective K -theory.	7
1.2. Implications for minimal primes.	11
1.3. Euler classes and Chern classes.	14
1.4. Bockstein spectral sequences.	18
1.5. The Künneth theorem.	21
Chapter 2. Examples of ku -cohomology of finite groups.	27
2.1. The technique.	28
2.2. Cyclic groups.	32
2.3. Nonabelian groups of order pq .	36
2.4. Quaternion groups.	43
2.5. Dihedral groups.	51
2.6. The alternating group of degree 4.	59
Chapter 3. The ku -homology of finite groups.	63
3.1. General behaviour of $ku_*(BG)$.	63
3.2. The universal coefficient theorem.	66
3.3. Local cohomology and duality.	68
3.4. The ku -homology of cyclic and quaternion groups.	69
3.5. The ku -homology of BD_8 .	71
3.6. Tate cohomology.	76
Chapter 4. The ku -homology and ku -cohomology of elementary abelian groups.	79
4.1. Description of results.	79
4.2. The ku -cohomology of elementary abelian groups.	81
4.3. What local cohomology ought to look like.	87
4.4. The local cohomology of Q .	88
4.5. The 2-adic filtration of the local cohomology of Q .	93
4.6. A free resolution of T .	94

4.7.	The local cohomology of T .	99
4.8.	Hilbert series.	102
4.9.	The quotient P/T_2 .	103
4.10.	The local cohomology of R .	104
4.11.	The ku -homology of BV .	105
4.12.	Duality for the cohomology of elementary abelian groups.	109
4.13.	Tate cohomology of elementary abelian groups.	111
Appendix A.	Conventions.	115
A.1.	General conventions.	115
A.2.	Adams spectral sequence conventions.	115
Appendix B.	Indices.	117
B.1.	Index of calculations.	117
B.2.	Index of symbols.	117
B.3.	Index of notation.	118
B.4.	Index of terminology.	122
Appendix.	Bibliography	125