

Contents

1.	The Burnside ring of finite G -sets	1
1.1.	Finite G -sets	1
1.2.	The Burnside ring $A(G)$	1
1.3.	Congruences between fixed point numbers	4
1.4.	Idempotent elements	7
1.5.	Units	8
1.6.	Prime ideals	9
1.7.	An example: The alternating group A_5	10
1.8.	Comments	11
1.9.	Exercises	12
2.	The J -homomorphism and quadratic forms	14
2.1.	The J -homomorphism	14
2.2.	Quadratic forms on torsion groups. Gauß sums	15
2.3.	The quadratic J -homomorphism	22
2.4.	Comments	25
2.5.	Exercises	25
3.	λ -rings	27
3.1.	Definitions	27
3.2.	Examples	31
3.3.	γ -operations	33
3.4.	Adams operations	35
3.5.	Adams operations on representation rings	38
3.7.	The Bott cannibalistic class θ_k	40
3.8.	p -adic γ -rings	41

3.9.	The operation \mathfrak{S}_k	47
3.10.	Oriented \mathfrak{Y} -rings	49
3.11.	The action of \mathfrak{S}_k on scalar \mathfrak{Y} -rings	53
3.12.	The connection between Θ_k and \mathfrak{S}_k	57
3.13.	Decomposition of p-adic \mathfrak{Y} -rings	59
3.14.	The exponential isomorphism \mathfrak{S}_k	61
3.15.	Thom-isomorphism and the maps $\Theta_k, \Theta_k^{\text{or}}$	67
3.16.	Comments	68
3.17.	Exercises	69
4.	Permutation representations	70
4.1.	p-adic completion	70
4.2.	Permutation representations over F_q	71
4.3.	Representations of 2-groups over F_3	74
4.4.	Permutation representations over \mathbb{Q}	80
4.5.	Comments	81
5.	The Burnside ring of a compact Lie group	82
5.1.	Euler Characteristics	82
5.2.	Euclidean neighbourhood retracts	86
5.3.	Equivariant Euler-Characteristic	91
5.4.	Universal Euler-Characteristic for G-spaces	98
5.5.	The Burnside ring of a compact Lie group	103
5.6.	The space of subgroups	107
5.7.	The prime ideal spectrum of $A(G)$	111
5.8.	Relations between Euler-Characteristics	118
5.9.	Finiteness theorems	121
5.10.	Finite extensions of the torus	131
5.11.	Idempotent elements	137
5.12.	Fundorrial properties	143
5.13.	Multiplicative induction and symmetric powers	149

5.14.	An example: The group $SO(3)$.	155
5.15.	Comments	156
5.16.	Exercises	157
6.	Induction theory	159
6.1.	Mackey functors	159
6.2.	Frobenius functors and Green functors	165
6.3.	Hyerelementary induction	168
6.4.	Comments	171
6.5.	Exercises	171
7.	Equivariant homology and cohomology	172
7.1.	A general localization theorem	172
7.2.	Classifying spaces for families of isotropy groups	175
7.3.	Adjacent families	177
7.4.	Localization and orbit families	180
7.5.	Localization and splitting of equivariant homology	185
7.6.	Transfer and Mackey structure	188
7.7.	Localization of equivariant K -theory	193
7.8.	Localization of the Burnside ring	198
7.9.	Comments	200
8.	Equivariant homotopy theory	201
8.1.	Generalities	201
8.2.	Homotopy equivalences	205
8.3.	Obstruction theory	210
8.4.	The equivariant Hopf theorem	212
8.5.	Geometric modules over the Burnside ring	214
8.6.	Prime ideals of equivariant cohomotopy rings	221
8.7.	Comments	226
8.8.	Exercises	227

9.	Homotopy equivalent group representations	228
9.1.	Notations and results	228
9.2.	Dimension of fixed point sets	230
9.3.	The Schur index	237
9.4.	The groups $i(G)$ and $iO(G)$	241
9.5.	Construction of homotopy equivalences	249
9.6.	Homotopy equivalences for p -groups	252
9.7.	Equivariant K -theory and fixed point degrees	254
9.8.	Exercises	259
10.	Geometric modules over the Burnside ring	260
10.1.	Local J -groups	260
10.2.	Projective modules	261
10.3.	The Picard group and invertible modules	267
10.4.	Comments	277
11.	Homotopy equivalent stable G -vector bundles	278
11.1.	Introduction and results about local J -groups	278
11.2.	Mapping degrees. Orientations.	281
11.3.	Maps between representations and vector bundles	283
11.4.	Local J -groups at p	286
11.5.	Local J -groups away from p	291
11.6.	Projective modules	293
	References	296
	Notation	309