

Preface	vii
Symbols and Notations	xi
CHAPTER IV. On Modules	
§.4.1. Modules over a group or a ring	409
§.4.2. Submodules, quotient modules, faithful module and annihilator	420
§.4.3. Module homomorphisms	424
§.4.4. Sum and direct sum of modules	432
§.4.5. Chain condition, Artin and Noether modules, maximum and minimum conditions	446
§.4.6. Submodule generated by a subset and R-linear independence	457
§.4.7. Simplicity, semi-simplicity and composition series	465
§.4.8. Free modules	483
§.4.9. Tensor product	490
§.4.10. Exact sequences, extensions, projective and injective modules	500
§.4.11. Chain complexes, homology and cohomology modules	518
Problems with hints or solutions for Chapter IV . . .	525
CHAPTER V. On Module Homomorphisms	

§.5.1.	Dimensionality of a Γ -module	539
§.5.2.	Simplicity and semi-simplicity of a Γ -endo	552
§.5.3.	Projection mapping and ring of Γ -endos	557
§.5.4.	Fitting decomposition w.r.t. a Γ -endo	566
§.5.5.	Some properties of polynomials of a K -endo	578
§.5.6.	Minimal polynomial of a K -endo	583
§.5.7.	Eigen vectors and eigen values of a K -endo	588
§.5.8.	Characteristic polynomial and eigen-space decomposition of a K -endo	594
§.5.9.	Primary-component decomposition w.r.t. a K -endo	609
§.5.10.	Bilinear forms and inner products on K -modules	619
§.5.11.	Group representations	633
	Problems with hints or solutions for Chapter V	637

CHAPTER VI. On Algebras

§.6.1.	Algebras, ideals and quotient algebras	649
§.6.2.	Derivation mappings	656
§.6.3.	Algebra homomorphisms	663
§.6.4.	Free algebras	666
§.6.5.	Tensor algebras and symmetric algebras	674
§.6.6.	Exterior product and exterior algebra	679
§.6.7.	Lie algebras	690
§.6.8.	Derivation mappings, solvability, nilpotency and semi-simplicity in Lie algebras	698

§.6.9. Extensions and representations	709
Problems with hints or solutions for Chapter VI . . .	718
INDEX OF DEFINITIONS	727