

CONTENTS

Preface ... ix

1. Hemirings and semirings: definitions and examples ... 1
2. Sets and relations with values in a semiring ... 19
3. Building new semirings from old ... 27
4. Some conditions on semirings ... 43
5. Complemented elements in semirings ... 59
6. Ideals in semirings ... 65
7. Prime and semiprime ideals in semirings ... 85
8. Factor semirings ... 95
9. Morphisms of semirings ... 105
10. Kernels of morphisms ... 121
11. Semirings of fractions ... 129
12. Euclidean semirings ... 135
13. Additively-regular semirings ... 143
14. Semimodules over semirings ... 149
15. Factor semimodules ... 163
16. Some constructions for semimodules ... 181
17. Free, projective, and injective semimodules ... 191
18. Localization of semimodules ... 203
19. Linear algebra over a semiring ... 211
20. Partially-ordered semirings ... 223
21. Lattice-ordered semirings ... 239
22. Complete semirings ... 247
23. Complete semimodules ... 259
24. CLO-semirings ... 267
25. Fixed points of affine maps ... 285

References ... 307

Index of applications ... 355

Index of terminology ... 357