CONTENTS

PREFACE VII

CHAPTER 1 - OPERATORS IN FINITE-DIMENSIONAL NORMED SPACES . . 1

§1. Norms of vectors, linear functionals, and linear operators. 1
§2. Survey of spectral theory 14
§3. Spectral radius 17
§4. One-parameter groups and semigroups of operators. . . . 25
Appendix. Conditioning in general computational problems . 28

CHAPTER 2 - SPECTRAL PROPERTIES OF CONTRACTIONS 33

§1. Contractive operators and isometries. 33
§2. Stability theorems. 46
§3. One-parameter semigroups of contractions and groups of isometries. 48
§4. The boundary spectrum of extremal contractions. 52
§5. Extreme points of the unit ball in the space of operators. 64
§6. Critical exponents. 66
§7. The apparatus of functions on graphs. 72
§8. Combinatorial and spectral properties of ℓ_∞-contractions 81
§9. Combinatorial and spectral properties of nonnegative matrices. 96
§10. Finite Markov chains. 102
§11. Nonnegative projectors. 108

CHAPTER 3 - OPERATOR NORMS 113

§1. Ring norms on the algebra of operators in E 113
§2. Characterization of operator norms. 126
§3. Operator minorants. 133
§4. Suprema of families of operator norms 141
§5. Ring cross-norms. 150
§6. Orthogonally-invariant norms. 152

CHAPTER 4 - STUDY OF THE ORDER STRUCTURE ON THE SET OF RING NORMS 157

§1. Maximal chains of ring norms. 157
§2. Generalized ring norms. 160
§3. The lattice of subalgebras of the algebra End(E) . . . 166
§4. Characterization of automorphisms 179

Brief Comments on the Literature 201

References 205