contents

Preface ix

Chapter 1. INTRODUCTION 1

Chapter 2. A BRIEF HISTORY OF THE LASER 9

Chapter 3. LASER THEORY AND PRINCIPLES 18

Chapter 4. ENHANCEMENTS TO LASER OPERATION 37

Chapter 5. EXTERNAL OPTICS AND THEIR FUNCTIONS 50

Chapter 6. VARIATIONS ON THE LASER THEME: A CLASSIFICATION OF MAJOR TYPES 77

Chapter 7. HELIUM-NEON LASERS 87

Chapter 8. NOBLE GAS ION LASERS 103

Chapter 9. HELIUM-CADMIUM LASERS 121

Chapter 10. CARBON DIOXIDE LASERS 132

Chapter 11. CHEMICAL LASERS 150

Chapter 12. COPPER AND GOLD VAPOR LASERS 163

Chapter 13. EXCIMER LASERS 174

Chapter 14. NITROGEN LASERS 193

Chapter 15. FAR-INFRARED GAS LASERS 203

Chapter 16. OTHER COMMERCIAL GAS LASERS 215

Chapter 17. DYE LASERS 222

Chapter 18. NEAR-INFRARED SEMICONDUCTOR DIODE LASERS 246

Chapter 19. LEAD-SALT AND OTHER LONG-WAVELENGTH INFRARED SEMICONDUCTOR DIODE LASERS 271

Chapter 20. NEODYMIUM LASERS 284

Chapter 21. RUBY LASERS 303

Chapter 22. VIBRONIC SOLID-STATE LASERS 314

Chapter 23. COLOR-CENTER LASERS 326

Chapter 24. OTHER SOLID-STATE LASERS 337

Appendix A GLOSSARY 341

Appendix B TYPES OF LASERS 367

Index 369