

CONTENTS

| | |
|--|------------|
| <i>Preface</i> | vii |
| Chapter 1. First Concerns | 1 |
| 1. Examples of Singular Perturbation Problems | 1 |
| 2. Asymptotic Expansions | 12 |
| 3. Intuitive Approach of Matched Asymptotic Expansions | 15 |
| 4. Two-Variable Expansions | 22 |
| Chapter 2. The Regular Perturbation Method | 27 |
| Chapter 3. Linear Boundary Value Problems | 35 |
| 1. Second-Order Problems | 35 |
| 2. Higher-Order Problems | 45 |
| 3. Generalizations of These Results | 59 |
| Chapter 4. Nonlinear Initial Value Problems | 76 |
| 1. The Basic Problem | 76 |
| 2. Two-Parameter Problems | 94 |
| 3. Differential-Difference Equations with Small Delay | 102 |
| Chapter 5. Nonlinear Boundary Value Problems | 115 |
| 1. Some Second-Order Scalar Problems | 115 |
| 2. Second-Order Quasi-Linear Equations | 119 |
| 3. Quasi-Linear Systems | 125 |
| 4. An Extended Discussion of a Nonlinear Example | 134 |

| | |
|--|------------|
| Chapter 6. The Singularly Perturbed Linear State Regulator Problem | 139 |
| Chapter 7. Boundary Value Problems with Multiple Solutions Arising in Chemical Reactor Theory | 157 |
| Chapter 8. Some Turning Point Problems | 168 |
| 1. A Simple Problem | 168 |
| 2. A Uniform Reduction Theorem | 178 |
| 3. The Boundary Value Problem | 184 |
| References | 190 |
| <i>Index</i> | 203 |

