Contents

| | Preface | vi |
|---------|--|----|
| | lcknowledgements | iz |
| Chapter | Optimal control problems, old and new | 1 |
| | Introduction | 1 |
| | Classical control problems | 3 |
| | Further analysis of the classical problem | 4 |
| | Metamorphosis | 6 |
| | The advantages of the new formulation, and a preview | 9 |
| | Existence | 13 |
| | Existence, and a topology | 13 |
| | The case of the unbounded controls | 16 |
| | Linear programs | 24 |
| | Introduction | 24 |
| | A first approximation | 25 |
| | Finite dimensions | 28 |
| | Approximations | 33 |
| | A first step | 33 |
| | The solution to the modified control problem | 41 |
| | Comments | 51 |
| | Some numerical results, and a method for global minimization | 53 |
| | A computational scheme | 53 |
| | Some numerical results | 57 |
| | A method for global optimization | 64 |
| | Comments | 68 |
| | Controllability | 70 |
| | A first approach, not completely successful | 70 |
| | An example | 73 |
| | A more general approach | 75 |

| | C 4 4 4 4 4 4 4 |
|----|-----------------|
| /1 | Contents |
| • | |

| • | 7 Hilbert space | 80 |
|--|--|-----|
| | 1 Introduction | 80 |
| | 2 Existence and approximation | 82 |
| : | 8 The diffusion equation | 86 |
| | 1 Existence | 86 |
| | 2 Strong controllability of the diffusion equation | 92 |
| Appendix Functions, functionals and measures | | |
| | 1 Spaces of functions. Linear continuous functionals | 102 |
| : | 2 A summary of classical measure theory | 105 |
| ; | 3 Functionals and measures | 108 |
| | 4 Extremal points and the minimum of a linear form | 112 |
| Reference | - | 118 |
| Index | | 120 |