## Contents

Chapter 1. Introduction

1.1 Sequential approximation : a prelude 1
1.2 Some areas of interest 3
1.3 Technical notes 6
1.4 Methods in vogue 7
1.5 A brief review 12
1.6 Specific problems to be dealt with 13

Chapter 2. Accurate calculations of covalent lattice sums

2.1 The covalent lattice-sum problem 16
2.2 Cubic lattices and the multipoint Padé method 18
2.3 The hexagonal close-packed lattice case 20
2.4 Concluding remarks 21

Chapter 3. Accurate calculations of ionic lattice sums

3.1 The ionic lattice-sum problem 22
3.2 Regular lattices and Padé approximants 22
3.3 Use of the multipoint Padé method 25
3.4 Problems with distorted lattices 25
3.5 A general strategy 27
3.6 Concluding remarks 28

Chapter 4. Sawtooth sequences and a subsequence extrapolation scheme

4.1 Some divergent sawtooth sequences 30
4.2 A simple subsequence extrapolation 31
4.3 The notion of summability 33
4.4 Sequential extrapolation – a further step 35
4.5 Some results 36
4.6 Concluding remarks 38
Chapter 5. Monotonic sequences and a converse of the Cesaro method 39

5.1 The Cesaro method 39
5.2 The converse scheme 40
5.3 Some results 42
5.4 Concluding remarks 44

6. Chebyshev polynomials and monotonic sequences 45

6.1 The spirit 45
6.2 The method and its implementation 46
6.3 Some results 49
6.4 Concluding remarks 50

Chapter 7. Applications of sequential approximation to other areas 52

7.1 Quantum-chemical SCF-type calculations 52
7.2 Calculation of some molecular integrals in series form 55
7.3 Estimation of critical parameters 57
7.4 Final remarks 59

References 61

Published work 65