Obsah

1 Errors, Condition and Instability 2
1.1 Errors 2
1.2 Condition 2
1.3 Instability 2
2 Solution of Nonlinear Equations 4
2.1 Separation of the Roots 4
2.2 Bisection Method 5
2.3 Regula falsi Method 6
2.4 Fixed point Iteration 7
2.5 Newton's Method 10
3 Polynomial Interpolation 12
3.1 Interpolation Problem 12
3.2 Interpolating Polynomial 12
3.3 Lagrange Interpolation Polynomial 13
3.4 Aitken's Algorithm 14
4 Systems of Linear Equations 16
4.1 Eigenvalues, Matrix Norms and Condition Number 16
4.2 Iterative Techniques 17
5 Systems of Nonlinear Equations 19
5.1 Newton's Method Spread to Systems of n Equations in n Unknows 19
5.2 Applying the Method of Iterations to Systems of n Equations in n Unknows 20
6. Numerical Quadrature 22
6.1 The Integration Formulas of Newton and Cotes 22
6.2 Trapezoidal method 23
6.3 Simpson's method 24
6.3 Double computation 25
6.4 The Monte Carlo method 26
7 Approximation of functions 27
7.1 Introduction 27
7.2 The Method of Least Squares 27
8 Statistics 29
8.1 Introduction 29
8.2 Probability Distributions 29
8.3 Measures of Central Tendency 32
8.4 Variance and Standard Deviation 33
8.5 Continuous random variables 34
8.6 The Normal Distribution 36
Literature 39