

CONTENTS

	IN	TRODUCTION	1
PART I	GENERATION OF ELEMENTARY FUNCTIONS		
	1.	Generation of Elementary Functions E. G. Kogbetliantz, Rockefeller Institute for Medical Research International Business Machines Corporation	7
PART II	MATRICES AND LINEAR EQUATIONS		
	2.	Matrix Inversion and Related Topics by Direct Methods Alex Orden, University of Chicago	39
	3.	The Solution of Linear Equations by the Gauss-Seidel Method R. Van Norton, Institute of Mathematical Sciences, New York University	56
	4.	The Solution of Linear Equations by the Conjugate Gradient Method F. S. Beckman, International Business Machines Corporation	62
	5.	Matrix Inversion by the Method of Rank Annihilation Herbert S. Wilf, The University of Illinois	73
	6.	Matrix Inversion by Monte Carlo Methods Florence Jeanne Oswald, Nuclear Development Corporation of America	78
	7.	The Determination of the Characteristic Roots of a Matrix by the Jacobi Method John Greenstadt, International Business Machines Corporation	84

			mems	
PART III	OR	DINARY DIFFERENTIAL EQUATIONS	93	
	8.	Numerical Integration Methods for the Solution of Ordinary Differential Equations Anthony Ralston, Bell Telephone Laboratories	95	
	9.	Runge-Kutta Methods for the Solution of Ordinary Differential Equations Michael J. Romanelli, Ballistic Research Laboratories	110	
	10.	The Numerical Solution of Boundary Value Problems Eugene L. Wachspress, Knolls Atomic Power Laboratory	121	
	11.	The Solution of Ordinary Differential Equations With Large Time Constants J. Certaine, Nuclear Development Corporation of America	128	
PART IV	PA	RTIAL DIFFERENTIAL EQUATIONS	133	
	12.	The Numerical Solution of Parabolic Partial Differential Equations Herbert B. Keller, Institute of Mathematical Sciences, New York University	135	
	13.	Iterative Methods for the Solution of Elliptic Partial Differential Equations J. W. Sheldon, Computer Usage Company, Inc.	144	
	14.	A Monte Carlo Method for the Solution of Elliptic Partial Differential Equations Carl N. Klahr, Technical Research Group	157	
	15.	The Numerical Solution of Hyperbolic Partial Differential Equations By the Method of Characteristics Mary Lister, The Pennsylvania State University	165	
	16.	The Solution of Hyperbolic Partial Differential Equations by Difference Methods P. Fox, Massachusetts Institute of Technology	180	
PART V	STA	ATISTICS	189	
	17.	Multiple Regression Analysis M. A. Efroymson, Esso Research and Engineering Company	191	
	18.	Factor Analysis Harry H. Harman, System Development Corporation	204	
	19.	Autocorrelation and Spectral Analysis Raymond W. Southworth, Yale University	213	
	20.	Analysis of Variance H. O. Hartley, Iowa State College	221	
PART VI	MISCELLANEOUS METHODS			
	21.	The Numerical Solution of Polynomial Equations Herbert S. Wilf, The University of Illinois	233	

22.	Methods for Numerical Quadrature Anthony Ralston, Bell Telephone Laboratories	242
23.	Multiple Quadrature by Monte Carlo Methods Herman Kahn, The RAND Corporation	249
24.	Fourier Analysis G. Goertzel, Nuclear Development Corporation of America	258
25.	The Solution of Linear Programming Problems Dean N. Arden, Massachusetts Institute of Technology	263
26.	Network Analysis T. R. Bashkow, Columbia University	280
Inde	291	

.