Book Reviews

Louis A. Pipes and Shahen A. Hovanessian: **Matrix Computer Methods in Engineering.** John Wiley & Sons Inc., New York, 1969, xi + 333 pp, 114 sh.

This textbook contains the elements of matrix algebra and matrix calculus with applications to a variety of engineering problems taken from the fields of electrical, mechanical and structural engineering. The titles of the various chapters are:
1. Basic definitions, determinants and linear algebraic equations.
2. Matrix algebra, simultaneous equations.
3. Eigenvalues, eigenvectors and quadratic forms.
4. Functions of matrices, matrix calculus and matrix differential equations.
5. Electrical applications of matrices.
6. Time-frequency domain analyses and the fast Fourier transform.
7. Formulation of vibration problems (conservative systems).
8. Formulation of vibration problems (non-conservative systems).
9. Structural application of matrices.

The first three chapters contain some simple programs written in FORTRAN or BASIC. The book has been written in a clear style and can be recommended for engineering students.

A. I. van de Vooren

B. Carnahan, H. A. Luther, J. O. Wilkes: **Applied Numerical Methods,** Wiley, New York, 1969, 604 pp, 132 sh.

This book contains 8 chapters with the following titles:
1. Interpolation and Approximation, 2. Numerical Integration, 3. Solution of Equations, 4. Matrices and Related Topics, 5. Systems of Equations, 6. The Approximations of the Solution of Ordinary Differential Equations, 7. Approximation of the Solution of Partial Differential Equations, 8. Statistical Methods. The book is intended to be an intermediate treatment of the theory and applications of numerical methods. Indeed, it gives much more than what is usually presented in a first course on this subject. For example, the first chapter also contains approximation by Chebyshev polynomials including telescoping of power series, the third chapter contains the q–d algorithm as an extension of Bernoulli's method, the fourth chapter contains the LR method for determining eigenvalues and eigenvectors and the seventh chapter gives much information on the solution of elliptic and parabolic equations, but almost nothing on hyperbolic equations.

The emphasis in the book is on the methods and their applications rather than on the analysis and the derivations. However, the derivations given are comprehensive and sound. More than half of the book is devoted to examples with computer programs written in FORTRAN-IV. These refer to numerical methods but also to engineering problems. Moreover, there is a substantial set of unworked problems at the end of each chapter.

It will be clear from the above that the reviewer thinks the book of high quality and as such would be willing to recommend it. The difficulty, however, is to which group it should be recommended. It seems not suitable for a first introduction, but for more advanced groups it has the disadvantage of containing also all the more elementary material. Also, the reviewer is somewhat doubtful about the value of the extensive computer programs especially those for the engineering problems; a student who has understood the method and who knows to program, will be able to write the program himself; the mathematical programs will be available in the libraries of most computing centers.

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