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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Roots of algebraic and transcendental equations -- 1.1 Equations -- 1.2 Polynomials -- 1.3 Descartes' rule -- 1.4 Synthetic division -- 1.5 Incremental search method -- 1.6 Refined incremental search method -- 1.7 Bisection method -- 1.8 Method of false position or linear interpolation -- 1.9 Secant method -- 1.10 Newton-Raphson method or Newton's tangent -- 1.11 Newton's second order method -- 1.12 Graeffe's root squaring method -- 1.13 Bairstow's method -- References -- 2. Solutions of simultaneous linear algebraic equations using matrix algebra -- 2.1 Simultaneous equations -- 2.2 Matrices -- 2.3 Matrix operations -- 2.4 Cramer's rule -- 2.5 Method of adjoints or cofactor method -- 2.6 Gaussian elimination method -- 2.7 Gauss-Jordan elimination method -- 2.8 Improved Gauss-Jordan elimination method -- 2.9 Cholesky decomposition method -- 2.10 Error equations -- 2.11 Matrix inversion method -- 2.12 Gauss-Seidel iteration method -- 2.13 Eigenvalues by Cramer's rule -- 2.14 Faddeev-Leverrier method -- 2.15 Power method or iteration method -- References -- 3. Numerical integration and differentiation -- 3.1 Trapezoidal rule -- 3.2 Romberg integration -- 3.3 Simpson's rule -- 3.4 Gaussian quadrature -- 3.5 Double integration by Simpson's one-third rule -- 3.6 Double integration by Gaussian quadrature -- 3.7 Taylor series polynomial expansion -- 3.8 Difference operators by Taylor series expansion -- 3.9 Numeric modeling with difference operators -- 3.10

Partial differential equation difference operators -- 3.11 Numeric modeling with partial difference operators -- References --
4. Matrix structural stiffness -- 4.1 Matrix transformations and coordinate systems -- 4.2 Rotation matrix -- 4.3 Transmission matrix -- 4.4 Area moment method -- 4.5 Conjugate beam method -- 4.6 Virtual work -- 4.7 Castigliano's theorems -- 4.8 Slope-deflection method -- 4.9 Moment-distribution method -- 4.10 Elastic member stiffness, X-Z system -- 4.11 Elastic member stiffness, X-Y system -- 4.12 Elastic member stiffness, 3-D system -- 4.13 Global joint stiffness -- References --
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Sommario/riassunto

As structural engineers move further into the age of digital computation and rely more heavily on computers to solve problems, it remains paramount that they understand the basic mathematics and engineering principles used to design and analyze building structures. The analysis of complex structural systems involves the knowledge of science, technology, engineering, and math to design and develop efficient and economical buildings and other structures. The link between the basic concepts and application to real world problems is one of the most challenging learning endeavors that structural engineers face. A thorough understanding of the analysis procedures should lead to successful structures.