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3.2.4 Frequency of Free Vibration; 3.2.5 Effect of Term Number Truncated in Polynomial Series; 3.2.6 Steel Portal Frame; 3.3 Appendix; 3.3.1 Chebyshev Polynomial Approach (Rice, 1992); 3.3.2 Expression of Elements in Equation (3.23); Chapter 4 Elastic Stiffness Equation of Composite Beam Element; 4.1 Characteristics and Classification of Composite Beam; 4.2 Effects of Composite Action on Elastic Stiffness of Composite Beam; 4.2.1 Beam without Composite Action; 4.2.2 Beam with Full Composite Action; 4.2.3 Beam with Partial Composite Action; 4.3 Elastic Stiffness Equation of Steel-Concrete Composite Beam Element; 4.3.1 Basic Assumptions; 4.3.2 Differential Equilibrium Equation of Partially Composite Beam; 4.3.3 Stiffness Equation of Composite Beam Element; 4.3.4 Equivalent Nodal Load Vector; 4.4 Example; 4.5 Problems in Present Work; Chapter 5 Sectional Yielding and Hysteretic Model of Steel Beam Columns; 5.1 Yielding of Beam Section Subjected to Uniaxial Bending; 5.2 Yielding of Column Section Subjected to Uniaxial Bending; 5.3 Yielding of Column Section Subjected to Biaxial Bending; 5.3.1 Equation of Initial Yielding Surface; 5.3.2 Equation of Ultimate Yielding Surface; 5.3.3 Approximate Expression of Ultimate Yielding Surface; 5.3.4 Effects of Torsion Moment; 5.4 Hysteretic Model; 5.4.1 Cyclic Loading and Hysteretic Behaviour; 5.4.2 Hysteretic Model of Beam Section; 5.4.3 Hysteretic Model of Column Section Subjected to Uniaxial Bending; 5.4.4 Hysteretic Model of Column Section Subjected to Biaxial Bending; 5.5 Determination of Loading and Deformation States of Beam-Column Sections; Chapter 6 Hysteretic Behaviour of Composite Beams; 6.1 Hysteretic Model of Steel and Concrete Material Under Cyclic Loading; 6.1.1 Hysteretic Model of Steel Stress-Strain Relationship

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Sommario/riassunto

Steel frames are used in many commercial high-rise buildings, as well as industrial structures, such as ore mines and oil rigs. Enabling construction of ever lighter and safer structures, steel frames have become an important topic for engineers. This book, split into two parts covering advanced analysis and advanced design of steel frames, guides the reader from a broad array of frame elements through to advanced design methods such as deterministic, reliability, and system reliability design approaches. This book connects reliability evaluation of structural systems to advanced analysis of

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