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Nota di contenuto	Preface; Contents; Introduction; Basic notation; 1 Equations of Thin Elastic Shell Theory; 1.1 Elements of Surface Theory; 1.2 Equilibrium Equations and Boundary Conditions; 1.3 Errors of 2D Shell Theory of Kirchhoff-Love Type; 1.4 Membrane Stress State; 1.5 Technical Shell Theory Equations; 1.6 Technical Theory Equations in the Other Cases; 1.7 Shallow Shells; 1.8 Initial Imperfections; 1.9 Cylindrical Shells; 1.10 The Potential Energy of Shell Deformation; 1.11 Problems and Exercises; 2 Basic Equations of Shell Buckling; 2.1 Types of Elastic Shell Buckling; 2.2 The Buckling Equations 2.3 The Buckling Equations for a Membrane State 2.4 Buckling Equations of the General Stress State; 2.5 Problems and Exercises; 3 Simple Buckling Problems; 3.1 Buckling of a Shallow Convex Shell; 3.2 Shallow Shell Buckling Modes; 3.3 The Non-Uniqueness of Buckling Modes; 3.4 A Circular Cylindrical Shell Under Axial Compression; 3.5 A Circular Cylindrical Shell Under External Pressure; 3.6 Estimates of

Critical Load; 3.7 Problems and Examples; 4 Buckling Modes Localized near Parallels; 4.1 Local Shell Buckling Modes; 4.2 Construction Algorithm of Buckling Modes
4.3 Buckling Modes of Convex Shells of Revolution 4.4 Buckling of Shells of Revolution Without Torsion; 4.5 Buckling of Shells of Revolution Under Torsion; 4.6 Problems and Exercises; 5 Non-homogeneous Axial Compression of Cylindrical Shells; 5.1 Buckling Modes Localized near Generatrix; 5.2 Reconstruction of the Asymptotic Expansions; 5.3 Axial Compression and Bending of Cylindrical Shell; 5.4 The Influence of Internal Pressure; 5.5 Buckling of a Non-Circular Cylindrical Shell; 5.6 Cylindrical Shell with Curvature of Variable Sign; 5.7 Problems and Exercises
6 Buckling Modes Localized at a Point 6.1 Local Buckling of Convex Shells; 6.2 Construction of the Buckling Mode; 6.3 Ellipsoid of Revolution Under Combined Load; 6.4 Cylindrical Shell Under Axial Compression; 6.5 Construction of the Buckling Modes; 6.6 Problems and Exercises; 7 Semi-momentless Buckling Modes; 7.1 Basic Equations and Boundary Conditions; 7.2 Buckling Modes for a Conic Shell; 7.3 Effect of Initial Membrane Stress Resultants; 7.4 Semi-Momentless Buckling Modes of Cylindrical Shells; 7.5 Problems and Exercises; 8 Effect of Boundary Conditions on Semi-momentless Modes
8.1 Construction Algorithm for Semi-Momentless Solutions 8.2 Semi-Momentless Solutions; 8.3 Edge Effect Solutions; 8.4 Separation of Boundary Conditions; 8.5 The Effect of Boundary Conditions on the Critical Load; 8.6 Boundary Conditions and Buckling of a Cylindrical Shell; 8.7 Conic Shells Under External Pressure; 8.8 Problems and Exercises; 9 Torsion and Bending of Cylindrical and Conic Shells; 9.1 Torsion of Cylindrical Shells; 9.2 Cylindrical Shell under Combined Loading; 9.3 A Shell with Non-Constant Parameters Under Torsion; 9.4 Bending of a Cylindrical Shell
9.5 The Torsion and Bending of a Conic Shell

Sommario/riassunto

This book contains solutions to the most typical problems of thin elastic shells buckling under conservative loads. The linear problems of bifurcation of shell equilibrium are considered using a two-dimensional theory of the Kirchhoff-Love type. The explicit approximate formulas obtained by means of the asymptotic method permit one to estimate the critical loads and find the buckling modes. The solutions to some of the buckling problems are obtained for the first time in the form of explicit formulas. Special attention is devoted to the study of the shells of negative Gaussian curvature, the b
