Variational And Quasi-variational Inequalities In Mechanics

[DOWNLOAD HERE](#)

1. Notation and Basics: - 1.1. Notations and Conventions; 1.2. Functional spaces; 1.3. Bases and complete systems. Existence theorem; 1.4. Trace Theorem; 1.5. The laws of thermodynamics; - 2. Variational Setting of Linear Steady-state Problems: - 2.1. Problem of the equilibrium of system with a finite number of degrees of Freedom; 2.2. Equilibrium of the simplest continuous systems governed by ordinary differential Equations; 2.3. 3D and 2D problems on the equilibrium of linear elastic bodies; 3.4. Positive definiteness of the potential energy of linear systems; - 3.Variational Theory for Nonlinear Smooth Systems: - 3.1. Examples of nonlinear systems; 3.2. Differentiation of operators and functionals; 3.3. Existence and uniqueness theorems of the minimal point of a functional; 3.4. Condition for the potentiality of an operator; 3.5. Boundary value problems in the Hencky-Ilyushin theory of plasticity without discharge; 3.6. Problems in the elastic bodies theory with finite displacements and strain; - 4. Unilateral Constraints and Non-Differentiable Functionals:- 4.1. Introduction: systems with finite degrees of freedom; 4.2. Variational methods in contact problems for deformed bodies without friction; 4.3. Variational method in contact problem with friction; - 5. The Transformation of Variational Principles: - 5.1. Friedrichs Transformation; 5.2. Equilibrium, mixed and hybrid variational principles in the theory of elasticity; 5.3. The Young-Fenchel-Moreau duality transformation; 5.4. Applications of duality transformations in contact problems; - 6. Non-Stationary Problems and Thermodynamics: - 6.1. Traditional principles and methods; 6.2. Gurtin s method; 6.3. Thermodynamics and mechanics of the deformed solids; 6.4. The variational theory of adhesion and crack initiation; - 7. Solution Methods and Numerical implementation: - 7.1. Frictionless contact problems: finite element method (FEM); 7.2. Friction contact problems: boundary element method (BEM); - 8. Concluding Remarks: - 8.1. Modelling. Identification problem. Optimization; 8.2. Development of the contact problems with friction, wear and adhesion; 8.3. Numerical implementation of the contact interaction phenomena; - References; Index. EAN/ISBN : 9781402063770 Publisher(s): Springer Netherlands Format: ePub/PDF Author(s): Kravchuk, Alexander S. - Neittaanmaki, Pekka J.

Similar manuals: