## Contents

1 **Basic Ideas** ............................. 1
  1.1 Definitions, Relations, and Theories .............. 3
    1.1.1 Elastic Solids .............................. 3
    1.1.2 Thermal Stresses ............................ 4
    1.1.3 Equations of Motion ......................... 6
    1.1.4 Thermomechanical Coupling .................... 7
    1.1.5 Classical Coupled Thermoelasticity ......... 7
    1.1.6 Lord–Shulman Model of Linear (1967) Thermoelasticity (L-S Model) or Extended Thermoelasticity (ETE) ........... 9
    1.1.7 Green–Lindsay Model of Linear Thermoelasticity (G-L Model (1972)) .................. 9
    1.1.8 Green–Naghdi Model of Thermoelasticity .......... 10
    1.1.9 Basic Relations and Equations in Magnetoelasticity .......... 11

2 **Vector-matrix Differential Equation and Numerical Inversion of Laplace Transform** .......................... 13
  2.1 Vector-matrix Differential Equation ................ 13
  2.2 Solution of Vector-matrix Differential Equation .......... 14
  2.3 Applications .................................. 17
  2.4 Numerical Inversion of Laplace Transform ............. 21

3 **Coupled Thermoelasticity** .................. 25
  3.1 Problem (i) .................................. 25
  3.2 Basic Equations and Formulation of the Problem ........ 26
  3.3 Solution Procedure ........................... 28
  3.4 Boundary Conditions ........................... 30

4 **Generalized Thermoelasticity** ............... 33
  4.1 Problem (i) .................................. 33
  4.2 Basic Equations and Formulation of the Problem .......... 34
  4.3 Solution Procedure ........................... 35

xiii
Problems and Solutions in Thermoelasticity and Magneto-thermoelasticity
Das, B.
2017, XIV, 104 p. 45 illus., 3 illus. in color., Hardcover
ISBN: 978-3-319-48807-3