

<<复合材料板壳力学解析理论>>

图书基本信息

书名：<<复合材料板壳力学解析理论>>

13位ISBN编号：9787118064322

10位ISBN编号：7118064327

出版时间：2009-12

出版时间：国防工业出版社

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页数：342

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内容概要

Due to the lack of the mathematical analytical tools, analytical studies on the mechanical response of composite plate and shell were difficult to be performed. A new type complex series method (NCSM) for solving the boundary value or eigenvalue problem of a system of partial differential equations with constant coefficients is presented. The underdetermined functions of the governing equations are assumed in the complex series form. Substitution of the complex series into a system of the governing equations leads to characteristic root and the solutions in real series form. In the book, NCSM is applied to analyze the bending/vibration/buckling problems of rectangular, skew and circular laminated plate with symmetric and skew-sym-metric angle-ply using Classical Plate theory (CPT) and these analytical solutions are presented. General analytical solutions for the bending/vibration/buckling problems of rectangular/skew anisotropic plate using first-order shear deformation theory (FSDT) by NCSM are presented in the book. NCSM is also suggested to study the bending/vibration/buckling problems of generally laminated rectangular and skew plates using CPT and FSDT and some general analytical solutions are obtained. The analytical solutions on linear mechanical response of composite cylindrical shell using FSDT and CVI" with arbitrary laminations are obtained by NCSM. Some numerical results indicate the validity of NCSM. The effectiveness of the new technique is determined. NCSM is suggested to be one general method of solving for the boundary value or eigenvalue problem of a system of partial differential equations with constant coefficients. As an example, NCSM is also applied to analyze the problem for steady-state temperature in anisotropic rectangular, skew and circular domain and these general analytical solutions are also presented. There are three objectives of this book. Firstly, the fundamental concepts of NCSM is described. Secondly, the method is used to find the general solutions in series form for the mechanical behaviors of plate and shell concerning a number of structure parameters. Thirdly, some numerical results are presented as evaluation for researchers to use in checking numerical solutions. This book can be used as textbook or reference for senior or graduate students, for faculty members in engineering mechanics and applied mathematics.

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