



**SMTS-II**



# **THEORY OF STRUCTURES**

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**Dr. B.C. Punmia | Er. Ashok K. Jain | Dr. Arun K. Jain**



# **THEORY OF STRUCTURES**



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# THEORY OF STRUCTURES

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B.C. PUNMIA

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ASHOK KUMAR JAIN, ARUN KUMAR JAIN

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## PREFACE TO THE THIRD EDITION

In this volume, the author has attempted to present more advanced topics in strength of materials and mechanics of structure in a rigorous and coherent manner. Both volumes I and II cover the entire course for degree, diploma and AMIE examinations in this subject. Volume II has been divided into four parts. Part I contains four chapters on moving loads on statically determinate beams and frames, as well as on statically indeterminate beams. Part II deals with statically indeterminate structures and contains ten chapters, including a chapter on deflection of perfect frames. Part III contains five chapters on advanced topics on strength of materials. These chapters are mostly useful for mechanical engineering students. Part IV has three chapters on miscellaneous topics, including one on elementary theory of elasticity. The contents of the book are so designed that the book is equally useful to civil as well as mechanical and electrical engineering students.

The book is written entirely in metric units. Each topic introduced is thoroughly described, the theory is rigorously developed, and a large number of numerical examples are included to illustrate its application. General statements of important principles and methods are almost invariably given by practical illustration. A large number of problems are available at the end of each chapter, to enable the student to test his reading at different stages of his studies.

The author is highly thankful to Prof. S.C. Goyal and Shri O.P. Kalani for their permission to reproduce some chapters and examples from the book 'Strength of Materials and Theory of Structures Vol. II' written by the author in their collaboration. Thanks are also due to the senate of the London University and to the Secretary of the Institution of Structural Engineers, London, for their kind permission to reproduce their examination questions. The London University is in no way responsible for the accuracy of the answers. In preparing this text, the author has freely consulted many excellent books on the subject and the help is gratefully acknowledged.

Every effort was made to eliminate errors in the book, but should the reader discover some, the author would appreciate having these brought to his attention. Suggestions from the readers for improvement in the book will be most gratefully acknowledged.

*Jodhpur,*

*January 17, 1971*

B.C. PUNMIA

## PREFACE TO THE FOURTH EDITION

In the fourth edition, the subject matter of the book has been updated. An appendix, containing questions from the AMIE section B examinations in "Theory of Structures", has been added. The author is thankful to Shri J.N. Shrivastava for his valuable suggestions or improvements in the book.

*Jodhpur,*

*January 1, 1974*

B.C. PUNMIA

(vi)

## PREFACE TO THE SIXTH EDITION

In the Sixth Edition, the subject matter has been revised and updated. A larger number of Examples in SI units have been added at the end of the book.

*Jodhpur,*

*June 15, 1982*

B.C. PUNMIA

## PREFACE TO THE SEVENTH EDITION

In the Seventh Edition, the entire book has been rewritten using SI units. The old diagrams have been replaced by new ones.

*Jodhpur,*

*Deepawali 18 Nov. 1985*

B.C. PUNMIA

## PREFACE TO THE EIGHTH EDITION

In the Eighth Edition, the subject matter has been revised and updated. A new chapter on Building Frames has been added at the end of the book.

*Jodhpur,*

*Sept. 1, 1988*

B.C. PUNMIA

## PREFACE TO THE NINTH EDITION

In the Ninth Edition, the book has been completely rewritten. The book has been divided into four sections, Section 1, containing five chapters, is on 'Moving Loads'. Section 2 on 'Statically Indeterminates Structures', contain eleven chapters. Section three is devoted. to 'Advanced Topics in Strength of Materials' and has six chapters. Lastly, section 4 has six chapters on 'Miscellaneous Topics'. Thus in the Ninth Edition of the book, which has 28 chapters, five new chapters have been added.

In each chapter, the subject matter has been rearranged and new articles have been added. Many new advanced problems have been added which will be useful for competitive examinations.

*Jodhpur,*

*Mahaveer Jayantee, 15 April 1992*

B.C. PUNMIA  
ASHOK KUMAR JAIN  
ARUN KUMAR JAIN

(VII)

## PREFACE TO THE TWELFTH EDITION

The book has been thoroughly revised and enlarged, using revised sign conventions, for E.M. and S.F. Several Chapters, such as 'Influence lines for stresses on frames,' 'Three moment equation method,' 'Welded joints,' 'Plastic analysis and design' and 'Building frames' have been completely rewritten.

The book has been laser typeset in bigger size format, keeping pace with modern trend. Though utmost care has been taken to eliminate errors, some may still remain, and we would be thankful if these are pointed out. The Authors are thankful to Shri M.S. Gahlot for Laser Typesetting and to Shri Kanhya Lal for tracing the diagrams. Finally, the Authors are thankful to Shri R.K. Gupta of Laxmi Publications (P) Ltd. for good printing and excellent get up to the book and that too in a record short period.

Jodhpur  
15<sup>th</sup> August 2004

B.C. PUNMIA  
ASHOK KUMAR JAIN  
ARUN KUMAR JAIN

## PREFACE TO THE THIRTEENTH EDITION

The thirteenth edition of this book presents the undergraduate students of engineering and also the students of AMIE an updated and an extensively revised subject.

It is written in a lucid, easy and crystal-clear language. All the necessary information on Theory of Structures has been provided. The book is written in such a way as if a teacher is teaching the subject to the students in front of him and the students are receiving the same with spontaneity and without any extra effort.

The book contains 23 chapters. It is divided into three sections – Moving Loads, Statically Indeterminate Structures and Miscellaneous Topics. At the end of the last chapter, an Index is given.

Professors and students are welcome to send us their suggestions regarding the betterment of this book. Those will be duly considered in the subsequent edition.

B. C. PUNMIA  
ASHOK KUMAR JAIN  
ARUN KUMAR JAIN

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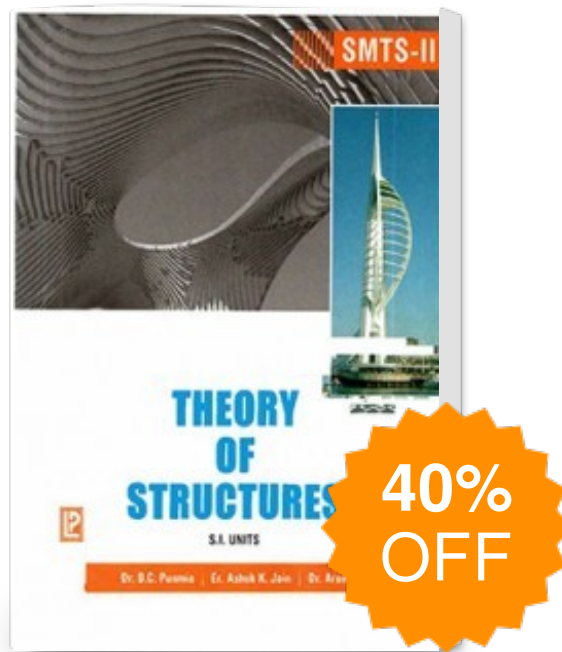
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