Serviceability failures of concrete structures involving excessive cracking or deflection are relatively common, even in structures that concrete designers, structural engineers, and civil engineers focused on structures. Concrete structures can be designed for durability by applying the principles and procedures of reliability theory combined with traditional structural design. This access to a solutions manual via the book’s companion website Structural Concrete: Theory and Design, Seventh Edition is an excellent text for undergraduate and graduate students in civil and structural engineering programs. It will also benefit professionals for over twenty years, this newly updated text on concrete structural design and analysis reflects the most recent ACI 318-19 code. It emphasizes student comprehension by presenting design methods alongside relevant codes and standards. It also offers numerous examples (presented using SI units and US-SI conversion factors) and practice problems to guide students through the analysis and design of each type of structural member. New to Structural Concrete: Durability, serviceability, and safety are the basic needs of all structures, reinforced concrete structures are subjected to a complex variety of stresses and strains. The four basic actions are bending, axial load, shear, and torsion. Presently, there is no unified theory of reinforced concrete structure behavior that addresses all of these basic actions and their interactions. Furthermore, there is little consistency among countries around the world in their building codes, especially in the specifications for shear and torsion. Unified Theory of Reinforced Concrete addresses this serious problem by integrating available information with new research data, developing one unified theory of reinforced concrete behavior that embraces and accounts for all four basic actions and their combinations. The theory is presented in a systematic manner, elucidating its five component models from a pedagogical and historical perspective while emphasizing the fundamental principles of equilibrium, compatibility, and the constitutive laws of materials. The relationships between models and their intrinsic consistencies are emphasized. This theory can serve as the foundation on which to build a universal design theory for reinforced concrete structures. It will be of great interest to designers and engineers involved in the design of concrete structures. The book can also serve well as a text for a graduate course in structural engineering. This book examines the application of strut-and-tie models (STM) for the design of structural concrete. It presents the state-of-the-art information, from fundamental theories to practical engineering applications, and also provides innovative solutions for many design problems that are not otherwise achievable using the traditional methods. This text primarily analyses different methods of concrete design as per IS 456: 2000 (Plain and Reinforced Concrete—Indian Standard Code of Practice) and prescriptive design as per Eurocode 2. It gives greater emphasis on the limit state method so as to illustrate the acceptable limits for the safety and serviceability requirements of structures. Besides dealing with yield line analysis for slabs, the book explains the working stress method and its use for designing reinforced concrete tension members. It introduces the concept of reliability in structural design and earthquake resistant design. Transverse reinforcement and shear in wide beams, hanger reinforcement, bi- directional interaction of one-way shear, and reference to ACI certifications Includes dozens of worked examples that explain the analysis and design of Precast concrete structures introduces talented designers and provides a practical guide to the design and analysis of precast concrete structures. 

**Summary at the end of the chapter to help student revise key points. Sixty-nine solved illustrative examples presenting step-by-step calculations. Chapter-end exercises to test student’s understanding of the concepts. Forty Tests to enable student to assess his knowledge.**
comply with code requirements. This is often as a result of a inadequate account for the time-dependent deformations of concrete in the design of the structure. The serviceability provisions embodied in codes of practice are relatively crude and, in some situations, unreliable and do not adequately model the in-service behaviour of structures. In particular, they fail to adequately account for the effects of creep and shrinkage of the concrete. Design for serviceability is complicated by the non-linear and inelastic behaviour of concrete at service loads. Providing detailed information, this book helps engineers to rationally predict the time-varying deformation of concrete structures under typical in-service conditions. It gives analytical methods to help anticipate time-dependent cracking, the gradual change in tension stiffening with time, creep induced deformations and the load independent strains caused by shrinkage and temperature changes. The calculation procedures are illustrated with many worked examples. A vital guide for practising engineers and advanced students of structural engineering on the design of concrete structures for serviceability and provides a penetrating insight into the time-dependent behaviour of reinforced and prestressed concrete structures. This textbook describes the basic mechanical features of concrete and explains the main resistant mechanisms activated in the reinforced concrete structures and foundations when subjected to centred and eccentric axial force, bending moment, shear, torsion and prestressing. It presents a complete set of limit-state design criteria of the modern theory of RC incorporating principles and rules of the final version of the official Eurocode 2. This textbook examines methodological more than notional aspects of the presented topics, focusing on the verifications of assumptions, the rigorousness of the analysis and the consequent degree of reliability of results. Each chapter develops an organic topic, which is eventually illustrated by examples in each final paragraph containing the relative numerical applications. These practical end-of-chapter appendices and intuitive flow-charts ensure a smooth learning experience. The book stands as an ideal learning resource for students of structural design and analysis courses in civil engineering, building construction and architecture, as well as a valuable reference for concrete structural design professionals in practice. The sixth edition of this comprehensive textbook provides the same philosophical approach that has gained wide acceptance since the first edition was published in 1985. The strength and behavior of concrete elements are treated with the primary objective of explaining and justifying the rules and formulas of the ACI Building Code. The treatment is incorporated into the chapters in such a way that the reader may study the concepts in a logical sequence in detail or merely accept a qualitative explanation and proceed directly to the design process using the ACI Code. This third edition of a popular textbook is a concise single-volume introduction to the design of structural elements in concrete, steel, timber, masonry, and composites. It provides design principles and guidance in line with both British Standards and Eurocodes, current as at late 2007. Topics discussed include the philosophy of design, basic structural concepts, and material properties. After an introduction and overview of design, the book is conveniently divided into sections based on British Standards and Eurocodes. Popular Mechanics inspires, instructs and influences readers to help them master the modern world. Whether it's practical DIY home-improvement tips, gadgets and digital technology, information on the newest cars or the latest breakthroughs in science -- PM is the ultimate guide to our high-tech lifestyle. Emphasizing a conceptual understanding of concrete design and analysis, this revised and updated edition builds the student's understanding by presenting design methods in an easy to understand manner supported with the use of numerous examples and problems. Written in intuitive, easy-to-understand language, it includes SI unit examples in all chapters, equivalent conversion factors from US customary to SI throughout the book, and SI unit design tables. In addition, the coverage has been completely updated to reflect the latest ACI 318-11 code. A self-contained, mathematical introduction to the driving ideas in equilibrium statistical mechanics, studying important models in detail. This revised, fully updated second edition covers the analysis, design, and construction of reinforced concrete structures from a real-world perspective. It examines different reinforced concrete elements such as slabs, beams, columns, foundations, basement and retaining walls and pre-stressed concrete incorporating the most up-to-date edition of the American Concrete Institute Code (ACI 318-14) requirements for the design of concrete structures. A new chapter on the design of formworks has been added which is of great value to students in the construction engineering programs along with practicing engineers and architects. This second edition also includes a new appendix with color images illustrating various concrete construction practices, and well-designed buildings. The ACI 318-14 constitutes the most extensive reorganization of the code in the past 40 years. References to the various sections of the ACI 318-14 are provided throughout the book to facilitate its use by students and professionals. Aimed at architecture, building construction, and undergraduate engineering students, the scope of concepts in this volume emphasize simplified and practical methods in the analysis and design of reinforced concrete. This is distinct from advanced, graduate engineering texts, where treatment of the subject centers around the theoretical and mathematical aspects of design. As in the first edition, this book adopts a step-by-step approach to solving analysis and design problems in reinforced concrete. Using a highly graphical and interactive approach in its use of detailed images and self-experimentation exercises, "Concrete Structures, Second Edition," is tailored to the most practical questions and fundamental concepts of design of structures in reinforced concrete. The text stands as an ideal learning resource for civil engineering, building construction, and architecture students as well as a valuable reference for concrete structural design professionals in practice. This book provides, in SI units, an integrated design approach to various reinforced concrete and steel structures, with particular emphasis on the logical presentation of steps conforming to Indian Standard Codes. Detailed drawings along with carefully chosen examples, many of them from examination papers, greatly facilitate the understanding of the subject. This Book Systematically Explains The Basic Principles And Techniques Involved In The Design Of Reinforced Concrete Structures. It Exhaustively Covers The First Course On The Subject At B.E./B.Tech Level. Important Features: * Exposition Is Based On The Latest Indian Standard Code Is: 456-2000. * Limit State Method Emphasized Throughout The Book. * Working Stress Method Also Explained. * Detailing Aspects Of Reinforcement Highlighted. * Incorporates Earthquake Resistant Design. * Includes A Large Number Of Solved Examples, Practice Problems And Illustrations. The Book Would Serve As A Comprehensive Text For Undergraduate Civil Engineering Students. Practising Engineers Would Also Find It A Valuable Reference Source. This volume traces the process by which reinforced concrete emerged during the 19th century as the successful building material of today. Early work on testing the strength of cements led into a period of experimental work by a number of engineers, notably in Britain, France and America, to devise successful systems of embedding iron in concrete in such a way that the two materials would act together to carry imposed loads. The papers take the story to the early years of the 20th century and provide a thorough review of the gradual evolution of ideas and the contributions of individuals to this technology. SSC Junior Engineer Civil & Structural Engineering Recruitment Exam Guide This new edition adds 2 new papers of 2017 & 3 new chapters in the Technical Section - Building Materials, Estimating, Costing & Valuation & Environmental Engineering. The book is divided into 3 Units (Civil & Structural Engineering, General Intelligence & Reasoning and General Awareness) & 44 Chapters. All the chapters contain detailed theory along with solved examples. Exemplative question bank at the end of each chapter is provided in the form of Exercise. Solutions to the Exercise have been provided at the end of each chapter. Solved Question paper of SSC Junior Engineer Civil & Structural 2017 (2 papers), 2016, 2015 & 2014 have been provided for students to understand the current pattern and level of questions. For courses in architecture and civil engineering. Reinforced Concrete: Mechanics and Design uses the theory of reinforced concrete design to teach students the basic scientific and artistic principles of civil engineering. The text takes a topic often introduced at the advanced level and makes it accessible to all audiences by building a foundation with core engineering concepts. The Seventh Edition is up-to-date with the latest Building Code for Structural Concrete, giving students access to accurate information that can be applied outside of the classroom. Students are able to apply complicated engineering concepts to real world scenarios with in-context examples and practice problems in each chapter. With explanatory features throughout, the Seventh Edition makes the reinforced concrete design theory all engineers can learn from.