

chemistry thermodynamics iit jee notes

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Explore comprehensive notes for IIT JEE Chemistry Thermodynamics, meticulously crafted to cover all essential concepts, formulas, and problem-solving strategies. This resource is designed to help students master complex topics, ensuring thorough preparation and confidence for both JEE Main and Advanced examinations.

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Thermochemistry and Thermodynamics

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A Complete IITJEE Preparation

While preparing for the entrance exams like NEET & AIIMS, the aspirants need to have a complete grip on the entire syllabus of the NCERT, in order to answer correctly during the exams. The revised edition of Master the NCERT series, once again brings to you a unique set objective questions of all typologies, based on NCERT classes XI & XII. The book 'Master the NCERT- Chemistry I' has been completely revised as per the latest NCERT class XI syllabus. Designed to give dual advantage to the students of class XI/XII, to score better in the board examinations as well as build a good foundation for the toughest entrances. With the help of revision notes, explanatory topics & MCQs, it assists in enhancing the conceptual clarity and preparation level of the aspirants, proving to be a perfect study resource to build the foundation over medical and engineering entrances. The book features: 1. Deals with class XI NCERT syllabus 2. Provides dual advantage to the students of class XI/ XII 3. Topic wise Objective Questions for each chapter 4. NCERT all types of Exemplar Objective Questions for practice 5. Complete coverage of Previous' Years Medical entrance Questions 6. Complete explanations for Difficult Questions 7. Latest exams' questions & revision notes on NCERT theory TABLE OF CONTENTS Some Basic Concepts of Chemistry, Structure of Atom, Classification of Elements &

Periodicity in Properties, Chemical Bonding and Molecular Structure, State of Matter, Thermodynamics, Equilibrium, Redox Reaction, Hydrogen, s- Block Elements, p- Block Elements, Organic Chemistry: Some Basic Principles and Techniques, Hydrocarbons, Environmental Chemistry.

Master The NCERT for NEET Chemistry - Vol.1

With the increase in questions framed aligning to the NCERT sources, the Series "MASTER THE NCERT" has been framed in a way to grasp each concept of NCERT for both School and Competitive exams. The new edition of "MASTER THE NCERT for NEET-JEE CHEMISTRY VOLUME 01" has been compiled to provide dual advantage for class XI/XII students. This book covers 14 chapters in a concise manner to get complete conceptual knowledge. Not only this, each chapter contains questions framed on each & every line of NCERT text. NEET Key Notes, MCQs, and explanatory concepts are also provided to enhance the preparation level of the aspirants. Rigorous practice with this book will prove to be a perfect study resource to build the foundation for NEET, JEE, and other entrance Exams. This book incorporates: 1. Complete coverage of the class XI syllabus 2. Key Notes for quick revision of each chapter 3. Topically divided objective questions in each chapter 4. NCERT Exemplar objective questions in each chapter 5. Separate sections covering NEET-type questions 6. Detailed Explanations for selected questions 7. Previous Years' Medical, Engineering & Other Entrance Questions

TABLE OF CONTENT

Some Basic Concepts of Chemistry, Structure of Atom, Classification of Elements & Periodicity in Properties, Chemical Bonding and Molecular Structure, State of Matter, Thermodynamics, Equilibrium, Redox Reaction, Hydrogen, s- Block Elements, p- Block Elements, Organic Chemistry: Some Basic Principles and Techniques, Hydrocarbons, Environmental Chemistry, NEET & JEE Questions (2022-2020)

Excel with Concepts of Physical Chemistry for IIT-JEE

1. The new Physics Quick Book is reference book Science students 2. This book provides quick short notes and important formulae for last minute preparation 3. Each chapter is covered with all the important formulae and concepts 4. This book for JEE, NEET & Class 11/12 exam

Short notes for last minute revision are very important as we don't have time to revise the entire syllabus. At the same time continuous revision of formulae and main concepts are equally important. Presenting, "Physics Quick Book" a reference book which is designed for the last minute preparation for JEE, NEET & Class 11/12 exam. It is divided into 22 different chapters, where every chapter is provided with quick short notes and listed with important formulae so that no student should skip any important chapter. Emphasizing on each chapter covers all the important formulae, concepts in a lucid and concise manner. This is a must have book for the quick revision at the last moment. TOC General Physics, Kinematics I, Kinematics II, Laws of Motion, Work, Power and Energy, Circular Motion, Centre of Mass, Momentum and Impulse, Rotational motion, Gravitation. Properties of Solid Fluid Mechanics, Simple Harmonic Motion, Wave Motion, Heat and Thermodynamics, Ray Optics, Wave Optics, Electrostatics, Current Electricity, Magnetic Effects of Current & Magnetism, Electromagnetic Introduction and Altering Current, Modern Physics, Semiconductors

Master the NCERT for NEET and JEE Chemistry Vol 1

An advanced-level textbook of physical chemistry for the graduate (B.Sc) and postgraduate (M.Sc) students of Indian and foreign universities. This book is a part of four volume series, entitled "A Textbook of Physical Chemistry – Volume I, II, III, IV".

CONTENTS:

Chapter 1. Quantum Mechanics – I: Postulates of quantum mechanics; Derivation of Schrodinger wave equation; Max-Born interpretation of wave functions; The Heisenberg's uncertainty principle; Quantum mechanical operators and their commutation relations; Hermitian operators (elementary ideas, quantum mechanical operator for linear momentum, angular momentum and energy as Hermitian operator); The average value of the square of Hermitian operators; Commuting operators and uncertainty principle(x & p ; E & t); Schrodinger wave equation for a particle in one dimensional box; Evaluation of average position, average momentum and determination of uncertainty in position and momentum and hence Heisenberg's uncertainty principle; Pictorial representation of the wave equation of a particle in one dimensional box and its influence on the kinetic energy of the particle in each successive quantum level; Lowest energy of the particle.

Chapter 2. Thermodynamics – I: Brief resume of first and second Law of thermodynamics; Entropy changes in reversible and irreversible processes; Variation of entropy with temperature, pressure and volume; Entropy concept as a measure of unavailable energy and criteria for the spontaneity of reaction; Free energy, enthalpy functions and their significance, criteria for spontaneity of a process; Partial

molar quantities (free energy, volume, heat concept); Gibb's-Duhem equation. Chapter 3. Chemical Dynamics – I: Effect of temperature on reaction rates; Rate law for opposing reactions of 1st order and 2nd order; Rate law for consecutive & parallel reactions of 1st order reactions; Collision theory of reaction rates and its limitations; Steric factor; Activated complex theory; Ionic reactions: single and double sphere models; Influence of solvent and ionic strength; The comparison of collision and activated complex theory. Chapter 4. Electrochemistry – I: Ion-Ion Interactions: The Debye-Huckel theory of ion-ion interactions; Potential and excess charge density as a function of distance from the central ion; Debye Huckel reciprocal length; Ionic cloud and its contribution to the total potential; Debye - Huckel limiting law of activity coefficients and its limitations; Ion-size effect on potential; Ion-size parameter and the theoretical mean-activity coefficient in the case of ionic clouds with finite-sized ions; Debye - Huckel-Onsager treatment for aqueous solutions and its limitations; Debye-Huckel-Onsager theory for non-aqueous solutions; The solvent effect on the mobility at infinite dilution; Equivalent conductivity (Λ) vs. concentration $c^{1/2}$ as a function of the solvent; Effect of ion association upon conductivity (Debye- Huckel - Bjerrum equation). Chapter 5. Quantum Mechanics – II: Schrodinger wave equation for a particle in a three dimensional box; The concept of degeneracy among energy levels for a particle in three dimensional box; Schrodinger wave equation for a linear harmonic oscillator & its solution by polynomial method; Zero point energy of a particle possessing harmonic motion and its consequence; Schrodinger wave equation for three dimensional Rigid rotator; Energy of rigid rotator; Space quantization; Schrodinger wave equation for hydrogen atom, separation of variable in polar spherical coordinates and its solution; Principle, azimuthal and magnetic quantum numbers and the magnitude of their values; Probability distribution function; Radial distribution function; Shape of atomic orbitals (s, p & d). Chapter 6. Thermodynamics – II: Clausius-Clayperon equation; Law of mass action and its thermodynamic derivation; Third law of thermodynamics (Nernst heat theorem, determination of absolute entropy, unattainability of absolute zero) and its limitation; Phase diagram for two completely miscible components systems; Eutectic systems, Calculation of eutectic point; Systems forming solid compounds $A_x B_y$ with congruent and incongruent melting points; Phase diagram and thermodynamic treatment of solid solutions. Chapter 7. Chemical Dynamics – II: Chain reactions: hydrogen-bromine reaction, pyrolysis of acetaldehyde, decomposition of ethane; Photochemical reactions (hydrogen - bromine & hydrogen -chlorine reactions); General treatment of chain reactions (ortho-para hydrogen conversion and hydrogen - bromine reactions); Apparent activation energy of chain reactions, Chain length; Rice-Herzfeld mechanism of organic molecules decomposition (acetaldehyde); Branching chain reactions and explosions (H_2 - O_2 reaction); Kinetics of (one intermediate) enzymatic reaction : Michaelis-Menton treatment; Evaluation of Michaelis 's constant for enzyme-substrate binding by Lineweaver-Burk plot and Eadie-Hofstae methods; Competitive and non-competitive inhibition. Chapter 8. Electrochemistry – II: Ion Transport in Solutions: Ionic movement under the influence of an electric field; Mobility of ions; Ionic drift velocity and its relation with current density; Einstein relation between the absolute mobility and diffusion coefficient; The Stokes- Einstein relation; The Nernst -Einstein equation; Walden's rule; The Rate-process approach to ionic migration; The Rate process equation for equivalent conductivity; Total driving force for ionic transport, Nernst - Planck Flux equation; Ionic drift and diffusion potential; the Onsager phenomenological equations; The basic equation for the diffusion; Planck-Henderson equation for the diffusion potential.

Physics Quick Books

Cracking JEE Main & Advanced requires skills to solve a variety of thought-provoking problems with requisite synthesis of many concepts and may additionally require tricky mathematical manipulations. A massive collection of the most challenging problems, the Selected Problems Series comprises of 3 books, one each for Physics, Chemistry and Mathematics to suit the practice needs of students appearing for upcoming JEE Main and Advanced exam. Ranjeet Shahi's, 1500 Selected Problems Asked in Chemistry aims to sharpen your Problem-Solving Skills according to the exam syllabi, across 30 logically sequenced chapters. Working through these chapters, you will be able to make precise inferences while avoiding the pitfalls in applying various laws of Chemistry. The Step-by-Step solutions to the problems in the book train you in both- the general and specific problem-solving strategies essential for all those appearing in JEE Main & Advanced and all other Engineering Entrance Examinations or anyone who is interested to Problem Solving in Chemistry.

A Textbook of Physical Chemistry – Volume 1

This book is meant to be a quick refresher for JEE (MAIN)/AIEEE aspirants. With the aim and scope of providing a comprehensive study package for aspirants of JEE (MAIN)/AIEEE, this crash course

focuses less on theory and more on concepts, formulae and tips. This is supported by plenty of practice problems based on the latest formats, structure and syllabus of JEE (MAIN)/AIEEE. This is further supplemented by a CD given along with this study kit with fully solved 2012 JEE (MAIN)/AIEEE question paper. Salient features: A Based on the latest pattern and syllabus of JEE (MAIN)/AIEEE A Solved examples, practice problems in each chapter A Previous years question papers fully solved A Less theory and more concepts, formulae and tips A Practice CD with fully solved JEE (MAIN)/AIEEE 2012 question paper A Plenty of problems for practice A Comprehensive, holistic revision of the complete syllabus of JEE (MAIN)/AIEEE A In-depth analysis of the recent trends of JEE (MAIN)/AIEEE A A quick and efficient study kit for JEE (MAIN)/AIEEE aspirants A Facilitates self-study. A Low priced, handy book for quick and efficient revision

A Problem Book In CHEMISTRY for IIT JEE

This book is an attempt to present Physical Chemistry in a new, innovative and an interesting manner. The whole text has been divided into 40 chapters. Mole Concept - the heart of Physical Chemistry has been discussed in 10 chapters. Important topics like Atomic Structure, Chemical Bonding, Gaseous State, Electrochemistry, Ionic Equilibrium, Thermodynamics have further been divided into 2-4 chapters each so as to discuss them exhaustively. The salient features of the book are: (i) Extensive and well-written theory (ii) Wide level of thought-provoking questions and problems in the form of Concept Building Exercises, Concept Testing Exercises and Objective Exercises. (iii) The logical order or sequencing of solved examples and questions. (iv) A new and innovative presentation supported by innumerable number of figures, Data tables, pictures, computer generated graphs or structures, analogies, and Interesting related facts in boxes, pictorial representation of crucial concepts. This is done to make learning easy and interesting. About the Author: Shishir Mittal received his B. Tech. in chemical engineering from IIT Bombay and is currently training Students for IIT-JEE in Kota.

Numerical Chemistry

Volume 5.

CRASH COURSE JEE(MAIN) / AIEEE - CHEMISTRY

Key Features: Covers problems of real life situations to develop learners' problem solving skills. Ideal for students willing to sharpen their engineering aptitude. Graded problems to suit average as well as high level students. About the Book: The book is an excellent classic on physics having relevance for the students of physical science at the senior secondary and undergraduate levels. It presents the problems with The related concepts at length under six core sections. For the ease of students appropriate formulas are given in each section. All difficult problems are explained in a lucid manner. The answers to all the problems are given at the end of the book.

New Pattern Physical Chemistry For Iit-Jee

1. The 'Master Resource book' gives complete coverage of Physics 2. Questions are specially prepared for AIEEE & JEE main exams 3. The book is divided into 2 parts; consisting 31 chapters from JEE Mains 4. Each chapter is accessorized with 2 Level Exercises and Exam Questions 5. Includes highly useful JEE Main Solved papers Comprehensively covering all topics of JEE Main Syllabus, here's presenting the revised edition of "Master Resource Book for JEE Main Physics" that is comprised for a systematic mastery of a subject with paramount importance to a problem solving. Sequenced as per the syllabus of class 11th & 12th, this book has been divided into two parts accordingly. Each chapter is contains essential theoretical concepts along with sufficient number of solved paper examples and problems for practice. To get the insight of the difficulty level of the paper, every chapter is provided with previous years' question of AIEEE & JEE. Single Correct Answer Types and Numerical Value Questions cover all types of questions. TOC PART I, Units and Measurements, Vector Analysis, Kinematics I (Motion in 1-0), Kinematics II (Projectile Motion), Circular Motion, Laws of Motion and Friction, Work, Energy and Power, Centre of Mass, Rotational Motion, Gravitation, Properties of Solids, Properties of Fluids, Thermometry, Calorimetry and Heat Transfer, Kinetic Theory of Gases, Thermodynamics, Oscillations, Waves, PART II, Electrostatics, Current Electricity, Magnetic Effects of Current, Magnetostatics, Electromagnetic Induction, Alternating Current, Electromagnetic Waves, Ray Optics and Optical Instruments, Wave Optics, Dual Nature of Radiation and Matter, Electronic Devices, Atoms and Nuclei, Communication System, Experimental Physics.

Problems and Solutions on Thermodynamics and Statistical Mechanics

The book "Chapter-wise Daily Practice Problem (DPP) Sheets for Physics JEE Main" contains: 1. Carefully selected Questions (30 per DPP) in Chapter-wise DPP Sheets for Practice. At the end one Full Test is provided. 2. The book is divided into 28 Chapter-wise DPPs based on the NCERT. 3. Time Limit, Maximum Marks, Cutoff, Qualifying Score for each DPP Sheet is provided. 4. These sheets will act as an Ultimate tool for Concept Checking & Speed Building. 5. Collection of 870 MCQ's of all variety of new pattern. 6. Covers all important Concepts of each Chapter. 7. As per latest pattern & syllabus of JEE Main exam.

Problems in General Physics

Atkins' Physical Chemistry: Molecular Thermodynamics and Kinetics is designed for use on the second semester of a quantum-first physical chemistry course. Based on the hugely popular Atkins' Physical Chemistry, this volume approaches molecular thermodynamics with the assumption that students will have studied quantum mechanics in their first semester. The exceptional quality of previous editions has been built upon to make this new edition of Atkins' Physical Chemistry even more closely suited to the needs of both lecturers and students. Re-organised into discrete 'topics', the text is more flexible to teach from and more readable for students. Now in its eleventh edition, the text has been enhanced with additional learning features and maths support to demonstrate the absolute centrality of mathematics to physical chemistry. Increasing the digestibility of the text in this new approach, the reader is brought to a question, then the math is used to show how it can be answered and progress made. The expanded and redistributed maths support also includes new 'Chemist's toolkits' which provide students with succinct reminders of mathematical concepts and techniques right where they need them. Checklists of key concepts at the end of each topic add to the extensive learning support provided throughout the book, to reinforce the main take-home messages in each section. The coupling of the broad coverage of the subject with a structure and use of pedagogy that is even more innovative will ensure Atkins' Physical Chemistry remains the textbook of choice for studying physical chemistry.

Master Resource Book in Physics for JEE Main 2022

Complete Chemistry For JEE-Main | JEE-Main & Advanced (Organic, Physical, Inorganic) Medium - English

Chapter-wise DPP Sheets for Physics JEE Main

An advanced-level textbook of inorganic chemistry for the graduate (B.Sc) and postgraduate (M.Sc) students of Indian and foreign universities. This book is a part of four volume series, entitled "A Textbook of Inorganic Chemistry – Volume I, II, III, IV". CONTENTS: Chapter 1. Stereochemistry and Bonding in Main Group Compounds: VSEPR theory, d π -p π bonds, Bent rule and energetic of hybridization. Chapter 2. Metal-Ligand Equilibria in Solution: Stepwise and overall formation constants and their interactions, Trends in stepwise constants, Factors affecting stability of metal complexes with reference to the nature of metal ion and ligand, Chelate effect and its thermodynamic origin, Determination of binary formation constants by pH-metry and spectrophotometry. Chapter 3. Reaction Mechanism of Transition Metal Complexes – I: Inert and labile complexes, Mechanisms for ligand replacement reactions, Formation of complexes from aquo ions, Ligand displacement reactions in octahedral complexes- acid hydrolysis, Base hydrolysis, Racemization of tris chelate complexes, Electrophilic attack on ligands. Chapter 4. Reaction Mechanism of Transition Metal Complexes – II: Mechanism of ligand displacement reactions in square planar complexes, The trans effect, Theories of trans effect, Mechanism of electron transfer reactions – types; Outer sphere electron transfer mechanism and inner sphere electron transfer mechanism, Electron exchange. Chapter 5. Isopoly and Heteropoly Acids and Salts: Isopoly and Heteropoly acids and salts of Mo and W: structures of isopoly and heteropoly anions. Chapter 6. Crystal Structures: Structures of some binary and ternary compounds such as fluorite, antiferite, rutile, antirutile, cristobalite, layer lattices- CdI₂, BiI₃; ReO₃, Mn₂O₃, corundum, perovskite, Ilmenite and Calcite. Chapter 7. Metal-Ligand Bonding: Limitation of crystal field theory, Molecular orbital theory, octahedral, tetrahedral or square planar complexes, Bonding and molecular orbital theory. Chapter 8. Electronic Spectra of Transition Metal Complexes: Spectroscopic ground states, Correlation and spin-orbit coupling in free ions for 1st series of transition metals, Orgel and Tanabe-Sugano diagrams for transition metal complexes (d 1 – d 9 states), Calculation of Dq , B and β parameters, Effect of distortion on the d-orbital energy levels, Structural evidence from electronic spectrum, John-Teller effect, Spectrochemical and nephelauxetic series, Charge transfer spectra,

Electronic spectra of molecular addition compounds. Chapter 9. Magnetic Properties of Transition Metal Complexes: Elementary theory of magneto-chemistry, Gouy's method for determination of magnetic susceptibility, Calculation of magnetic moments, Magnetic properties of free ions, Orbital contribution, effect of ligand-field, Application of magneto-chemistry in structure determination, Magnetic exchange coupling and spin state cross over. Chapter 10. Metal Clusters: Structure and bonding in higher boranes, Wade's rules, Carboranes, Metal Carbonyl Clusters - Low Nuclearity Carbonyl Clusters, Total Electron Count (TEC). Chapter 11. Metal-Complexes: Metal carbonyls, structure and bonding, Vibrational spectra of metal carbonyls for bonding and structure elucidation, Important reactions of metal carbonyls; Preparation, bonding, structure and important reactions of transition metal nitrosyl, dinitrogen and dioxygen complexes; Tertiary phosphine as ligand.

Atkins' Physical Chemistry 11e

Containing the very latest information on all aspects of enthalpy and internal energy as related to fluids, this book brings all the information into one authoritative survey in this well-defined field of chemical thermodynamics. Written by acknowledged experts in their respective fields, each of the 26 chapters covers theory, experimental methods and techniques and results for all types of liquids and vapours. These properties are important in all branches of pure and applied thermodynamics and this vital source is an important contribution to the subject hopefully also providing key pointers for cross-fertilization between sub-areas.

Complete Chemistry For JEE-Main | JEE-Main & Advanced (Organic, Physical, Inorganic) Medium - English

The scope of thermodynamics. Definitions; the concept of equilibrium. Conventions and mathematical methods. Solutions. The first law of thermodynamics and the concept of energy. The fugacity. Application of the second law to solutions. The perfect solution. The laws of the dilute solution. Systems involving variables other than pressure, temperature and composition. A useful function, called the activity, and its application to solutions. Change of activity with the temperature, and the calculation of activity from freezing points. The standard change of free energy; the equilibrium constant. Solutions of electrolytes. The activity of strong electrolytes. The activity of electrolytes from freezing point data, and tables of activity coefficients. Activity coefficient in mixed electrolytes; the principle of the ionic strength; the activity of individual ions. The galvanic cell. Single potentials; standard electrode potentials of the elements. The third law of thermodynamics. The entropy of monatomic gases and a table of atomic entropies. Introduction to systematic free energy calculations: the free energy of elementary hydrogen and metallic hydrides. Oxygen and its compounds with hydrogen and with some metals. Chlorine and its compounds. Bromine and its compounds. Iodine and its compounds. Nitrogen compounds. Carbon and some of its compounds. Compounds of carbon and nitrogen. Table of free energies; and examples illustrating its use. Conversion table for mol fractions, mol ratios and molities. Some useful numerical factors. Coefficients employed in converting activity, equilibrium constant and free energy from one temperature to another. Publications by the authors, pertaining to thermodynamics.

A Textbook of Inorganic Chemistry – Volume 1

This book – specifically developed as a novel textbook on elementary classical mechanics – shows how analytical and numerical methods can be seamlessly integrated to solve physics problems. This approach allows students to solve more advanced and applied problems at an earlier stage and equips them to deal with real-world examples well beyond the typical special cases treated in standard textbooks. Another advantage of this approach is that students are brought closer to the way physics is actually discovered and applied, as they are introduced right from the start to a more exploratory way of understanding phenomena and of developing their physical concepts. While not a requirement, it is advantageous for the reader to have some prior knowledge of scientific programming with a scripting-type language. This edition of the book uses Matlab, and a chapter devoted to the basics of scientific programming with Matlab is included. A parallel edition using Python instead of Matlab is also available. Last but not least, each chapter is accompanied by an extensive set of course-tested exercises and solutions.

Modern Thermodynamics by the Methods of Willard Gibbs

An advanced-level textbook of organic chemistry for the graduate (B.Sc) and postgraduate (M.Sc) students of Indian and foreign universities. This book is a part of the four-volume series, entitled "A

Textbook of Organic Chemistry – Volume I, II, III, IV". CONTENTS: CHAPTER 1. Nature of Bonding in Organic molecules: Delocalized Chemical Bonding; Conjugation; Cross Conjugation; Resonance; Hyperconjugation; Tautomerism; Aromaticity in Benzenoid and Nonbenzenoid Compounds; Alternant and Non-Alternant Hydrocarbons; Huckel's Rule: Energy Level of p-Molecular Orbitals; Annulenes; Antiaromaticity; Homo-Aromaticity; PMO Approach; Bonds Weaker than Covalent; Addition Compounds: Crown Ether Complexes and Cryptands, Inclusion Compounds, Cyclodextrins; Catenanes and Rotaxanes CHAPTER 2. Stereochemistry: Chirality; Elements of symmetry; Molecules with more than one chiral centre: diastereomerism; Determination of relative and absolute configuration (octant rule excluded) with special reference to lactic acid, alanine & mandelic acid; Methods of resolution; Optical purity; Prochirality; Enantiotopic and diastereotopic atoms, groups and faces; Asymmetric synthesis: Cram's rule and its modifications, Prelog's rule; Conformational analysis of cycloalkanes (upto six membered rings); Decalins; Conformations of sugars; Optical activity in absence of chiral carbon (biphenyls, allenes and spiranes); Chirality due to helical shape; Geometrical isomerism in alkenes and oximes; Methods of determining the configuration CHAPTER 3. Reaction Mechanism: Structure and Reactivity: Types of mechanisms; Types of reactions; Thermodynamic and kinetic requirements; Kinetic and thermodynamic control; Hammond's postulate; Curtin-Hammett principle; Potential energy diagrams: Transition states and intermediates; Methods of determining mechanisms; Isotope effects; Hard and soft acids and bases; Generation, structure, stability and reactivity of carbocations, carbanions, free radicals, carbenes and nitrenes; Effect of structure on reactivity; The Hammett equation and linear free energy relationship; Substituent and reaction constants; Taft equation CHAPTER 4. Carbohydrates: Types of naturally occurring sugars; Deoxy sugars; Amino sugars; Branch chain sugars; General methods of determination of structure and ring size of sugars with particular reference to maltose, lactose, sucrose, starch and cellulose. CHAPTER 5. Natural and Synthetic Dyes: Various classes of synthetic dyes including heterocyclic dyes; Interaction between dyes and fibers; Structure elucidation of indigo and Alizarin CHAPTER 6. Aliphatic Nucleophilic Substitution: The S_N2 , S_N1 , mixed S_N1 and S_N2 , S_Ni , S_N1' , S_N2' , S_Ni' and SET mechanisms; The neighbouring group mechanisms; neighbouring group participation by p and s bonds; anchimeric assistance; Classical and nonclassical carbocations; Phenonium ions; Common carbocation rearrangements; Applications of NMR spectroscopy in the detection of carbocations; Reactivity- effects of substrate structure, attacking nucleophile, leaving group and reaction medium; Ambident nucleophiles and regioselectivity; Phase transfer catalysis. CHAPTER 7. Aliphatic Electrophilic Substitution: Bimolecular mechanisms – $SE2$ and SEi ; The $SE1$ mechanism; Electrophilic substitution accompanied by double bond shifts; Effect of substrates, leaving group and the solvent polarity on the reactivity CHAPTER 8. Aromatic Electrophilic Substitution: The arenium ion: mechanism, orientation and reactivity, energy profile diagrams; The ortho/para ratio, ipso attack, orientation in other ring systems; Quantitative treatment of reactivity in substrates and electrophiles; Diazonium coupling; Vilsmeier reaction; Gattermann-Koch reaction CHAPTER 9. Aromatic Nucleophilic Substitution: The $ArSN1$, $ArSN2$, Benzyne and $SRN1$ mechanisms; Reactivity – effect of substrate structure, leaving group and attacking nucleophile; The von Richter, Sommelet-Hauser, and Smiles rearrangements CHAPTER 10. Elimination Reactions: The $E2$, $E1$ and $E1cB$ mechanisms; Orientation of the double bond; Reactivity – effects of substrate structures, attacking base, the leaving group and the medium; Mechanism and orientation in pyrolytic elimination CHAPTER 11. Addition to Carbon-Carbon Multiple Bonds: Mechanistic and stereochemical aspects of addition reactions involving electrophiles, nucleophiles and free radicals; Regio- and chemoselectivity: orientation and reactivity; Addition to cyclopropane ring; Hydrogenation of double and triple bonds; Hydrogenation of aromatic rings; Hydroboration; Michael reaction; Sharpless asymmetric epoxidation. CHAPTER 12. Addition to Carbon-Hetero Multiple Bonds: Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds, acids, esters and nitriles; Addition of Grignard reagents, organozinc and organolithium; Reagents to carbonyl and unsaturated carbonyl compounds; Wittig reaction; Mechanism of condensation reactions involving enolates – Aldol, Knoevenagel, Claisen, Mannich, Benzoin, Perkin and Stobbe reactions; Hydrolysis of esters and amides; Ammonolysis of esters.

Enthalpy and Internal Energy:

Annotation A design textbook attempting to bridge the gap between traditional academic textbooks, which emphasize individual concepts and principles; and design handbooks, which provide collections of known solutions. The airbreathing gas turbine engine is the example used to teach principles and methods. The first edition appeared in 1987. The disk contains supplemental material. Annotation c. Book News, Inc., Portland, OR (booknews.com).

Modern Approach To Chemical Calculations An Introduction To The Mole Concept

GKP's Physics Galaxy Lecture Notes Series is an ideal preparation set for the Physics division of the exams such as IIT JE (Mains and Advance), BITSAT and NEET. This series covers 4 volumes covering 4 major sections of Physics namely- Volume-I Mechanics, Volume-II Thermodynamics, oscillations and waves, Volume-III Electricity and Magnetism and Volume IV Optics and Modern Physics. All notes in all four volumes are supported with video lectures to help the students prepare better. Features:

- *Comprehensive notes with video lectures
- *Covers the major divisions of Physics
- * Designed as per the exam pattern

Thermodynamics and the Free Energy of Chemical Substances

The scientific study of the biochemical and chemical phenomena occurring in the environment is known as environmental chemistry. It also encompasses the study of the sources, transport reactions, effects and future of chemical species present in the soil, air and water. It also delves into the anthropogenic and biological influence on these. Environmental chemistry is an interdisciplinary science that integrates the principles of aquatic, atmospheric, soil and analytical chemistry. The chemical pollutants that contaminate the environment include heavy metals from industry, organometallic compounds, urban runoff and nutrients leaching from agricultural lands. This book is a compilation of chapters that discuss the most vital concepts in the field of environmental chemistry. Such selected concepts that redefine this field have been presented herein. Those in search of information to further their knowledge will be greatly assisted by this book.

Elementary Mechanics Using Matlab

When chemical reagents are combined some of the reagents remain unmixed when the reaction is complete. Catalysts can reduce the amount of unmixed reagents, making the reaction more efficient, and the shape of the catalyst can be an important consideration. This volume surveys the field and collects new research on both experimental and theoretical aspects of shape-selective catalysis and catalytic materials.

A Textbook of Organic Chemistry – Volume 1

The design of structures in general, and prestressed concrete structures in particular, requires considerably more information than is contained in building codes. A sound understanding of structural behaviour at all stages of loading is essential. This textbook presents a detailed description and explanation of the behaviour of prestressed concrete members and structures both at service loads and at ultimate loads and, in doing so, provide a comprehensive and up-to-date guide to structural design. Much of the text is based on first principles and relies only on the principles of mechanics and the properties of concrete and steel, with numerous worked examples. However, where the design requirements are code specific, this book refers to the provisions of Eurocode 2: Design of Concrete Structures and, where possible, the notation is the same as in Eurocode 2. A parallel volume is written to the Australian Standard for Concrete Structures AS3600-2009. The text runs from an introduction to the fundamentals to in-depth treatments of more advanced topics in modern prestressed concrete structures. It suits senior undergraduate and graduate students and also practising engineers who want comprehensive introduction to the design of prestressed concrete structures. It retains the clear and concise explanations and the easy-to-read style of the first edition, but the content has been extensively re-organised and considerably expanded and updated. New chapters cover design procedures, actions and loads; prestressing systems and construction requirements; connections and detailing; and design concepts for prestressed concrete bridges. The topic of serviceability is developed extensively throughout. All the authors have been researching and teaching the behaviour and design of prestressed concrete structures for over thirty-five years and the proposed new edition of the book reflects this wealth of experience. The work has also gained much from Professor Gilbert active and long-time involvement in the development of standards for concrete buildings and concrete bridges.

Aircraft Engine Design

Suitable for both a first or second course in fluid mechanics at the graduate or advanced undergraduate level, this book presents the study of how fluids behave and interact under various forces and in various applied situations - whether in the liquid or gaseous state or both.

The book "Chapter-wise Daily Practice Problem (DPP) Sheets for Chemistry NEET" contains: 1. Carefully selected Questions (45 per DPP) in Chapter-wise DPP Sheets for Practice. 2. The book is divided into 30 Chapter-wise DPPs based on the NCERT. 3. Time Limit, Maximum Marks, Cutoff, Qualifying Score for each DPP Sheet is provided. 4. These sheets will act as an Ultimate tool for Concept Checking & Speed Building. 5. Collection of 1395 MCQ's of all variety of new pattern. 6. Covers all important Concepts of each Chapter. 7. As per latest pattern & syllabus of JEE Main exam.

Physics Galaxy Vol. II Lecture Notes on Thermodynamics, Oscillation & Waves (JEE Mains & Advance, BITSAT, NEET)

This revision of the introductory textbook of physical chemistry has been designed to broaden its appeal, particularly to students with an interest in biological applications.

Introduction to Environmental Chemistry

Lecture Notes in Mechanics are aimed to ensure fundamental understanding and advance applications of concepts of students. The book will act as a valuable supplement for the aspirants of JEE Mains and Advance, BITSAT, NEET and AIIMS. All lecture notes in the book are linked with their video explanations and are available online at 'Physics Galaxy' - The World's Largest Video Encyclopedia of high school physics lectures.

Shape-selective Catalysis

Advanced Problems in Physical Chemistry has been conceived to meet the specific requirements of the students preparing for IIT-JEE, Olympiad and other competitive examinations. This book provides a comprehensive and systematic coverage of problems in physical chemistry and enables quick applications of concepts through numerous problems provided in each chapter. The problems are graded as per JEE Main and Advanced respectively. The best way to ensure that students understand the concepts of physical chemistry is to solve as many problems on each topic. This book is a must-have resource for candidates preparing for JEE Main and Advanced exams.

Design of Prestressed Concrete to Eurocode 2, Second Edition

Pearson IIT Foundation Series, one of the most reliable and comprehensive source of content for competitive readiness, is now thoroughly updated and redesigned to make learning more effective and interesting for students. The core objective of this series is to help aspiring students understand the fundamental concepts with clarity, in turn, helping them to master the art of problem-solving. Hence, great care has been taken to present the concepts in a lucid manner with the help of neatly sketched illustrations and well thought-out real-life examples. As a result, this series is indispensable for any student who intends to crack high-stakes examinations such as Joint Entrance Examination (JEE), National Talent Search Examination (NTSE), Olympiads-Junior/Senior /International, Kishore Vaigyanik Protsahan Yojana (KVPY), etc. The series consists of 12 books spread across Physics, Chemistry, and Mathematics for classes VII to X.

Fluid Mechanics

Introduction. Response to harmonic excitation. General forced response. Multiple-degree of -freedom systems. Design for vibration suppression. Distributed - parameter systems ...

Chapter-wise DPP Sheets for Chemistry NEET

Reactions Rearrangements And Reagents