

Ram Prasad For Chemical Enggineering E Book

• 12 Years Solved Papers 2010-2021 (Year-wise) with detailed explanations • 2 Sample Question Papers – Smart Answer key with detailed explanations. • Blended Learning (Print and online support) • Tips & Tricks to crack the Exam in first attempt • GATE Qualifying Cut-offs and Highest Marks of 2021 and 2020-Stream-wise • GATE General Aptitude 2021 to 2017 – Trend Analysis • GATE Score Calculation • Mind Maps and Mnemonics

This comprehensive edited book on microbial prospective discusses the innovative approaches and investigation strategies, as well as provides a broad spectrum of the cutting-edge research on the processing, properties and technological developments of microbial products and their applications. Microbes finds very important applications in our lives including industries and food processing. They are widely used in the fermentation of beverages, processing of dairy products, production of pharmaceuticals, chemicals, enzymes, proteins and biomaterials; conversion of biomass into fuel, fuel cell technology, health and environmental sectors. Some of these products are produced commercially, while others are potentially valuable in biotechnology. Microorganisms are considered invaluable in research as model organisms. This is a useful compilation for students and researchers in microbiology, biotechnology and chemical industries.

CHEMICAL PROCESS CALCULATIONSPHI Learning Pvt. Ltd.

Bioremediation refers to the clean-up of pollution in soil, groundwater, surface water, and air using typically microbiological processes. It uses naturally occurring bacteria and fungi or plants to degrade, transform or detoxify hazardous substances to human health or the environment. For bioremediation to be effective, microorganisms must enzymatically attack the pollutants and convert them to harmless products. As bioremediation can be effective only where environmental conditions permit microbial growth and action, its application often involves the management of ecological factors to allow microbial growth and degradation to continue at a faster rate. Like other technologies, bioremediation has its limitations. Some contaminants, such as chlorinated organic or high aromatic hydrocarbons, are resistant to microbial attack. They are degraded either gradually or not at all, hence, it is not easy to envisage the rates of clean-up for bioremediation implementation. Bioremediation represents a field of great expansion due to the important development of new technologies. Among them, several decades on metagenomics expansion has led to the detection of autochthonous microbiota that plays a key role during transformation. Transcriptomic guides us to know the expression of key genes and proteomics allow the characterization of proteins that conduct specific reactions. In this book we show specific technologies applied in bioremediation of main interest for research in the field, with special attention on fungi, which have been poorly studied microorganisms. Finally, new approaches in the field, such as CRISPR-CAS9, are also discussed. Lastly, it introduces management strategies, such as bioremediation application for managing affected environment and bioremediation approaches. Examples of successful bioremediation applications are illustrated in radionuclide entrapment and retardation, soil stabilization and remediation of polycyclic aromatic hydrocarbons, phenols, plastics or fluorinated compounds. Other emerging bioremediation methods include electro bioremediation, microbe-availed phytoremediation, genetic recombinant technologies in enhancing plants in accumulation of inorganic metals, and metalloids as well as degradation of organic pollutants, protein-metabolic engineering to increase bioremediation efficiency, including nanotechnology applications are also discussed.

Engineered Nanomaterials for Innovative Therapies and Biomedicine

Volume 2, Approaches in Nanoparticles, Biosynthesis, and Toxicity

Engineering Heat Transfer

Khanna's Objective Type Questions & Answers in Chemical Engineering

Piping Design Handbook

Bio-valorization of Waste

This book is targeted to benefit the diploma in engineering students. Degree in engineering students (B.Tech-Chemical Engineering,

Petroleum Engineering, Petrochemical Engineering, Aeronautical Engg., AMIE, AMIICHE, students etc. M. Tech students of various disciplines pursuing courses on petroleum refining. Faculty members/teaching staff of engineering college/IIT's/NIT's etc. Practicing petroleum engineers/consultants/refiners in various private sector/public sector undertakings, state/central government departments, NGO's etc. Students of foreign universities of developing countries pursuing diploma/degree/postgraduate courses in various engineering disciplines having a paper in petroleum refinery engineering.

This book presents select proceedings of Conference on Recent Trends in Fluid Dynamics Research (RTFDR-21). It signifies the current research trends in fluid dynamics and convection heat transfer for both laminar and turbulent flow structures. The topics covered include fluid mechanics and applications, microfluidics and nanofluidics, numerical methods for multiphase flows, cavitation, combustion, fluid-particle interactions in turbulence, biological flows, CFD, experimental fluid mechanics, convection heat transfer, numerical heat transfer, fluid power, experimental heat transfer, heat transfer, non-newtonian rheology, and boundary layer theory. The book also discusses various fundamental and application-based research of fluid dynamics, heat transfer, combustion, etc., by theoretical and experimental approaches. The book will be a valuable reference for beginners, researchers, and professionals interested in fluid dynamics research and allied fields.

Research on biomedical applications of nanomaterials has exhibited the rapidly evolving field of biomedical sciences by showing how effective they are in treatment. These particles hold considerable potential for biomedical applications. Work is ongoing, and the results suggest a possibility for a sustainable future for nanomaterials in both therapeutic and biomedical fields. This book highlights current and emerging applications, taking global research findings into consideration. We believe the focus on the identification and role of nanomaterial applications in therapeutic and biomedical sciences can lead to novel solutions in the fields. The chapters of this book are disseminated in a manner that can be readily adopted as sources for new and further study. The editors integrate advanced texts in their research that help graduate students, researchers and professors. Additionally, we believe that international readers will be able to make use of this book for reference purposes.

This textbook covers the entire gamut of project scoping, identification, development and appraisal and is primarily designed to meet the requirements of postgraduate students of management and

engineering education. Researchers, consultants, policy makers and professionals in project management will find it a good body of knowledge as a reference source. The objective of the book is to provide a multidisciplinary grounding to the readers so that they can develop all the skills and competencies required to view or manage the entire project management process as an integrated whole. The book has been written in an easy-to-understand style and uses live case studies of renewable energy projects to illustrate the concepts, so that the students/readers understand them in the context of the real world. Though based on renewable energy projects, majority of the concepts explained in the book are applicable to other industrial projects equally - detailed guidance and notes on this aspect is given appropriately in the book.

Introduction to Chemical Engineering

Advanced Research in Nanosciences for Water Technology

Encyclopedia of Chemical Processing and Design

Environmental Technology and Sustainability

Physical, Chemical and Biological Technologies for Clean Environmental Management

This encyclopedic volume covers almost every phase of piping design - presenting procedures in a straightforward way.;Written by 82 world experts in the field, the Piping Design Handbook: details the basic principles of piping design; explores pipeline shortcut methods in an in-depth manner; and presents expanded rules of thumb for the piping design

Environmental Technology and Sustainability: Physical, Chemical and Biological Technologies for Clean Environmental Management provides a dependable source of information on the fundamental scientific evidence involved in environmental protection and sustainable development. The book provides the basic natural sciences that underpin the understanding, development and application of environment technologies that support a clean inhabitable world that includes environmental technologies and sustainable, renewable energy systems. It considers the science and technology for environmental benefits, including the development of both smarter, cleaner technologies for environmental protection, conservation, and more. Provides methods and processes for CO2 Sequestration Focuses on technologies for reducing greenhouse gases and for biofuel production Outlines issues surrounding contaminated water and provides solutions for water management Describes problems facing air pollution, including sources and mitigation Includes contaminated soil management

The most complete guide of its kind, this is the standard handbook for chemical and process engineers. All new material on fluid flow, long pipe, fractionators, separators and accumulators, cooling towers, gas treating, blending, troubleshooting field cases, gas solubility, and density of irregular solids. This substantial addition of material will also include conversion tables and a new appendix, "Shortcut Equipment Design Methods."This convenient volume helps

solve field engineering problems with its hundreds of common sense techniques, shortcuts, and calculations. Here, in a compact, easy-to-use format, are practical tips, handy formulas, correlations, curves, charts, tables, and shortcut methods that will save engineers valuable time and effort. Hundreds of common sense techniques and calculations help users quickly and accurately solve day-to-day design, operations, and equipment problems.

"Written by engineers for engineers (with over 150 International Editorial Advisory Board members), this highly lauded resource provides up-to-the-minute information on the chemical processes, methods, practices, products, and standards in the chemical, and related, industries. "

Approaches in Bioremediation

Chemical Engineering Reviews

A TEXTBOOK OF CHEMICAL ENGINEERING THERMODYNAMICS

Process Calculations

Recent Trends in Fluid Dynamics Research

Bioenergy Research

The establishment of clean, safe water is one of the major challenges facing societies around the globe. The continued urbanization of human populations, the increasing manipulation of natural resources, and the resulting pollution are driving remarkable burden on water resources. Increasing demands for food, energy, and natural resources are expected to continue to accelerate in the near future in response to the demands of these changing human populations. In addition, the complexity of human activities is leading to a diversity of new chemical contaminants in the environment that represent a major concern for water managers. This will create increased pressure on both water quantity and quality, making it increasingly difficult to provide a sustainable supply of water for human welfare and activities. Although protection of water resources is the best long-term solution, we will also need innovative novel approaches and technologies to water treatment to ensure an adequate superior quality resource to meet these needs. Solving tomorrow ' s water issues will require unique approaches that incorporate emerging new technologies. Great advances have been made in the area of nanotechnology. Due to their unique physical and chemical properties, nanomaterials are extensively used in antibacterial medical products, membrane filters, electronics, catalysts, and biosensors. Nanoparticles can have distinctly different properties from their bulk counterparts, creating the opportunity for new materials with a diversity of applications. Recent developments related to water treatment include the potential use of carbon nanotubes, nanocompositae, nanospheres, nanofibers, and nanowires for the removal of a diversity of chemical pollutants. By exploiting the assets and structure of these new materials, such as increased surface area, high reactivity, and photocatalytic action, it will be possible to create technologies that can be very efficient at removing and degrading environmental pollutants. Understanding and using these unique properties should lead to innovative, cost-effective applications for addressing the complexities of emerging needs for water treatment and protection. Although still in the early stages, research into the application of nanotechnology shows great promise for solving some of these major global water issues. This comprehensive text describes the latest research and application methods in this rapidly advancing field.

A magisterial overview of the philosophies of the East. 'The time has come for global

philosophy to move beyond the model where the West is at the centre of radiating spokes of comparison.' Challenging the notion that Western philosophy is the best or only yardstick against which to judge the so-called 'non-Western' philosophies, Chakravarthi Ram-Prasad sets up a lively debate in which the great thought systems of the East are engaged very much in their own terms. The author's impressive sweep takes him through South Asia east to China and Japan, encompassing 3000 years of philosophy and including the ancient philosophies of India, Jainism, Buddhism, Daoism and Confucianism. At the same time, Ram-Prasad dispels the romantic illusion that there is some common mystical 'wisdom tradition' that binds together the cultures of the East. His aim is to give a sense of the diversity and depth of these philosophical cultures, as well as their sophistication and originality; and to make comparisons between them to illuminate their varied yet potentially universal appeal.

Microbial biosurfactant compounds are a group of structurally diverse molecules produced by microorganisms, and are mainly categorized according to their chemical structure. The diversity of microbial biosurfactants makes them versatile and means that they offer a range of capabilities, while at the same time being economically sustainable. As such, they have potential applications in environmental processes, as well as in food, biomedicine and other industries. This book discusses innovative approaches and cutting-edge research that utilize the various properties of biosurfactants. Drawing on research from around the globe, it provides an up-to-date review of biosurfactant applications and their importance in fields such as medicine, gene therapy, immunotherapy, antimicrobial bioremediation and agriculture. It also discusses their anti-adhesive properties. The book will appeal to academics and researchers in the field of microbiology, as well as policymakers. It also serves as additional reading material for undergraduate and graduate students of agriculture, ecology, soil science, and environmental sciences.

BIOENERGY RESEARCH Evaluates challenges and sustainable solutions associated with various biofuel technologies Bioenergy Research offers an authoritative guide to recent developments in green bioenergy technologies that are currently available including: bioethanol, biobutanol, biomethanol, bio-oil, biohydrogen, biogas and biomethane. The authors provide in-depth analysis and discuss the commercial viability of the various technological advances in bioenergy. Comprehensive in scope, the book explores the environmental, practical and economic implications associated with a variety of bioenergy options. The book also considers the rollback of fossil fuels, the cost and their replacement as well as practical solutions for these issues. This important resource: Presents up-to-date research and industrial developments for various bioenergy options Offers comparative evaluation of bioenergy technologies for commercial feasibility Reviews current challenges and sustainable solutions for a variety of biofuel technologies Contains a review of existing strategies for bioenergy production Bioenergy Research is a valuable guide for academic researchers and industrial scientists working in the fields of biofuels and bioenergy, environmental science and technology, microbial technology, bioprocess engineering, and waste valorization.

Trends and Perspectives

Chemical Engineering Thermodynamics

Elements of Petroleum Refinery Engineering

Objective Type Questions and Answers in Chemical Engineering
Volume 36 - Phosphorus to Pipeline Failure: Subsidence Strains
Advanced Fuzzy Logic Approaches in Engineering Science

Best-selling introductory chemical engineering book - now updated with far more coverage of biotech, nanotech, and green engineering • •Thoroughly covers material balances, gases, liquids, and energy balances. •Contains new biotech and bioengineering problems throughout. •Adds new examples and homework on nanotechnology, environmental engineering, and green engineering. •All-new student projects chapter. •Self-assessment tests, discussion problems, homework, and glossaries in each chapter.

Basic Principles and Calculations in Chemical Engineering, 8/e, provides a complete, practical, and student-friendly introduction to the principles and techniques of modern chemical, petroleum, and environmental engineering. The authors introduce efficient and consistent methods for solving problems, analyzing data, and conceptually understanding a wide variety of processes. This edition has been revised to reflect growing interest in the life sciences, adding biotechnology and bioengineering problems and examples throughout. It also adds many new examples and homework assignments on nanotechnology, environmental, and green engineering, plus many updates to existing examples. A new chapter presents multiple student projects, and several chapters from the previous edition have been condensed for greater focus. This text's features include: •

•Thorough introductory coverage, including unit conversions, basis selection, and process measurements. •Short chapters supporting flexible, modular learning. •Consistent, sound strategies for solving material and energy balance problems. •Key concepts ranging from stoichiometry to enthalpy. •Behavior of gases, liquids, and solids. •Many tables, charts, and reference appendices. •Self-assessment tests, thought/discussion problems, homework problems, and glossaries in each chapter.

An improved understanding of the interactions between nanoparticles and plant retorts, including their uptake, localization, and activity, could revolutionize crop production through increased disease resistance, nutrient utilization, and crop yield. This may further impact other agricultural and industrial processes that are based on plant crops. This two-volume book analyses the key processes involved in the nanoparticle delivery to plants and details the interactions between plants and nanomaterials. Potential plant nanotechnology applications for enhanced nutrient uptake, increased crop productivity and plant disease management are evaluated with careful consideration regarding safe use, social acceptance and ecological impact of these technologies. Plant Nanobionics: Volume 1, Advances in the Understanding of Nanomaterials Research and Applications begins the discussion of nanotechnology applications in plants with the characterization and nanosynthesis of various microbes and covers the mechanisms and etiology of nanostructure function in microbial cells. It focuses on the potential alteration of plant production systems through the controlled release of agrochemicals and targeted delivery of biomolecules. Industrial and medical applications are included. Volume 2 continues this discussion with a focus on biosynthesis and toxicity.

Designed as an undergraduate-level textbook in Chemical Engineering, this student-friendly, thoroughly class-room tested book, now in its second edition, continues to

provide an in-depth analysis of chemical engineering thermodynamics. The book has been so organized that it gives comprehensive coverage of basic concepts and applications of the laws of thermodynamics in the initial chapters, while the later chapters focus at length on important areas of study falling under the realm of chemical thermodynamics. The reader is thus introduced to a thorough analysis of the fundamental laws of thermodynamics as well as their applications to practical situations. This is followed by a detailed discussion on relationships among thermodynamic properties and an exhaustive treatment on the thermodynamic properties of solutions. The role of phase equilibrium thermodynamics in design, analysis, and operation of chemical separation methods is also deftly dealt with. Finally, the chemical reaction equilibria are skillfully explained. Besides numerous illustrations, the book contains over 200 worked examples, over 400 exercise problems (all with answers) and several objective-type questions, which enable students to gain an in-depth understanding of the concepts and theory discussed. The book will also be a useful text for students pursuing courses in chemical engineering-related branches such as polymer engineering, petroleum engineering, and safety and environmental engineering. New to This Edition • More Example Problems and Exercise Questions in each chapter • Updated section on Vapour–Liquid Equilibrium in Chapter 8 to highlight the significance of equations of state approach • GATE Questions up to 2012 with answers

This textbook is targetted to undergraduate students in chemical engineering, chemical technology, and biochemical engineering for courses in mass transfer, separation processes, transport processes, and unit operations. The principles of mass transfer, both diffusional and convective have been comprehensively discussed. The application of these principles to separation processes is explained. The more common separation processes used in the chemical industries are individually described in separate chapters. The book also provides a good understanding of the construction, the operating principles, and the selection criteria of separation equipment. Recent developments in equipment have been included as far as possible. The procedure of equipment design and sizing has been illustrated by simple examples. An overview of different applications and aspects of membrane separation has also been provided. ‘Humidification and water cooling’, necessary in every process industry, is also described. Finally, elementary principles of ‘unsteady state diffusion’ and mass transfer accompanied by a chemical reaction are covered. SALIENT FEATURES : • A balanced coverage of theoretical principles and applications. • Important recent developments in mass transfer equipment and practice are included. • A large number of solved problems of varying levels of complexities showing the applications of the theory are included. • Many end-chapter exercises. • Chapter-wise multiple choice questions. • An Instructors manual for the teachers.

GATE 2021 - Guide - Chemical Engineering

Eastern Philosophy

Process Systems Analysis and Control

Basic Principles and Calculations in Chemical Engineering

(in S.I. Units)

CHEMICAL PROCESS CALCULATIONS

This book highlights the importance of chemistry in human well-being by introducing the readers to the basic usefulness of chemistry in everyday life. Chemistry has helped in creating valuable products that have transformed the lifestyle of people. Since we spend lots of money in buying our daily requirements, there is a need for us to understand the benefits and hazards of using consumer products which contain chemicals. In this context, this book will help readers to make reasoned choices and intelligent decisions in buying consumer products which contain chemicals. This text is divided into seventeen chapters devoted to the basic necessities of life like food, shelter, clothing, healthcare, and energy and consumer products. Topics on chemistry in environment, crime, warfare, arts, conservation, communications and transportation are also highlighted in individual chapters. All these topics are discussed with regard to the needs of modern society. In this third edition, the various chapters have been updated with current information keeping the language simple and friendly. Critical thinking exercises and questions have been included. The style of questions included in the book is to meet the requirement of various competitive examinations such as Indian Civil Services and entrance examinations in medicine and engineering.

The present textbook is written for undergraduate students of chemical engineering as per the syllabus framed by AICTE curriculum. It explains the basic chemical process principles in a lucid manner. SI units, chemical stoichiometry and measures of composition, behaviour of gases, vapour pressure of pure substances, and humidity and saturation are covered in detail. In addition, mass and energy balances of chemical processes have also been described. Chemical processes without chemical reactions include fluid flow, mixing, evaporation distillation, absorption and stripping, liquid–liquid extraction, leaching and washing, adsorption, drying, crystallization and membrane separation process. SALIENT FEATURES • Description of all concepts and principles with a rich pedagogy for easy understanding • Correct use of SI units • Over 270 solved examples for understanding the basic concepts • Answers to all chapter-end numerical problems for checking the accuracy of calculations TARGET AUDIENCE • BE/B.Tech (Chemical Engineering)

The advent of Industry 4.0 has opened a data-rich avenue of predicting and controlling premature degradation of industrial materials. For any industrial construction or manufacturing projects, performing analysis on the structural integrity of materials is crucial for their sustainability. Corrosion Science: Modern Trends and Applications gives scholars a snapshot of recent contributions and development in the field of material corrosion. The book presents 12 chapters that cover topics such as corrosion testing methods, anti-corrosive coating mechanisms, corrosion in different types of products (electronics, polymers), industrial systems (power plants, concrete constructions, and hydraulic systems), and corrosion as a result of environmental characteristics (such as marine surroundings). The breadth of topics covered coupled with the reader-friendly presentation of the book make it

highly beneficial for students, research scholars, faculty members, and R&D specialists working in the area of corrosion science, material science, solid-state science, chemical engineering, and nanotechnology. Readers will be equipped with the knowledge to understand and plan industrial processes that involve measuring the reliability and integrity of material structures which are impacted by corrosive factors.

This book is meant for diploma students of chemical engineering and petroleum engineering both for their academic programmes as well as for competitive examination. This book Contains 18 chapters covering the entire syllabus of diploma course in chemical engineering and petrochemical engineering. This book in its present form has been designed to serve as an encyclopedia of chemical engineering so as to be ready reckoner apart from being useful for all types of written tests and interviews faced by chemical engineering and petrochemical engineering diploma students of the country. Since branch related subjects of petrochemical engineering are same as that of chemical engineering diploma students, so this book will be equally useful for diploma in petrochemical engineering students.

Corrosion Science: Modern Trends and Applications

The New Era of Environmental Microbiology and Nanobiotechnology

Plant Nanobionics

Refrigeration and Air Conditioning

Computational Quantum Chemistry

Select Proceedings of RTFDR 2021

Particle technology is a term used to refer to the science and technology related to the handling and processing of particles and powders. The production of particulate materials, with controlled properties tailored to subsequent processing and applications, is of major interest to a wide range of industries, including chemical and process, food, pharmaceuticals, minerals and metals companies and the handling of particles in gas and liquid solutions is a key technological step in chemical engineering. This textbook provides an excellent introduction to particle technology with worked examples and exercises. Based on feedback from students and practitioners worldwide, it has been newly edited and contains new chapters on slurry transport, colloids and fine particles, size enlargement and the health effects of fine powders. Topics covered include: Characterization (Size Analysis) Processing (Granulation, Fluidization) Particle Formation (Granulation, Size Reduction) Storage and Transport (Hopper Design, Pneumatic Conveying, Standpipes, Slurry Flow) Separation (Filtration, Settling, Cyclones) Safety (Fire and Explosion Hazards, Health Hazards) Engineering the Properties of Particulate Systems (Colloids, Respirable Drugs, Slurry Rheology) This book is essential reading for undergraduate students of chemical engineering on particle technology courses. It is also valuable supplementary reading for

students in other branches of engineering, applied chemistry, physics, pharmaceuticals, mineral processing and metallurgy. Practitioners in industries in which powders are handled and processed may find it a useful starting point for gaining an understanding of the behavior of particles and powders. Review of the First Edition taken from High Temperatures - High pressures 1999 31 243 – 251 "This is a modern textbook that presents clear-cut knowledge. It can be successfully used both for teaching particle technology at universities and for individual study of engineering problems in powder processing."

The text begins by reviewing, in a simple and precise manner, the physical principles of three pillars of Refrigeration and Air Conditioning, namely thermodynamics, heat transfer, and fluid mechanics. Following an overview of the history of refrigeration, subsequent chapters provide exhaustive coverage of the principles, applications and design of several types of refrigeration systems and their associated components such as compressors, condensers, evaporators, and expansion devices. Refrigerants too, are studied elaboratively in an exclusive chapter. The second part of the book, beginning with the historical background of air conditioning in Chapter 15, discusses the subject of psychrometrics being at the heart of understanding the design and implementation of air conditioning processes and systems, which are subsequently dealt with in Chapters 16 to 23. It also explains the design practices followed for cooling and heating load calculations. Each chapter contains several worked-out examples that clarify the material discussed and illustrate the use of basic principles in engineering applications. Each chapter also ends with a set of few review questions to serve as revision of the material learned.

This book is an outgrowth of the author's teaching experience of a course on Introduction to Chemical Engineering to the first-year chemical engineering students of the Indian Institute of Technology Madras. The book serves to introduce the students to the role of a chemical engineer in society. In addition to the classical industries, the role of chemical engineers in several esoteric areas such as semiconductor processing and biomedical engineering is discussed. Besides highlighting the principles and processes of chemical engineering, the book shows how chemical engineering concepts from the basic sciences and economics are used to seek solutions to engineering problems. The book is rich in examples of innovative solutions found to problems faced in chemical industry. It includes a wide spectrum of topics, selected from the industrial interactions of the author. It encourages the student to see the similarities in the concepts which govern apparently dissimilar examples. It introduces various concepts, using both physical and mathematical bases, to facilitate the understanding of difficult processes such as the scale-up process. The book contains several case studies on safety, ethics and environmental

issues in chemical process industries.

Computational Quantum Chemistry, Second Edition, is an extremely useful tool for teaching and research alike. It stipulates information in an accessible manner for scientific investigators, researchers and entrepreneurs. The book supplies an overview of the field and explains the fundamental underlying principles. It also gives the knowledge of numerous comparisons of different methods. The book consists of a wider range of applications in each chapter. It also provides a number of references which will be useful for academic and industrial researchers. It includes a large number of worked-out examples and unsolved problems for enhancing the computational skill of the users. Features Includes comprehensive coverage of most essential basic concepts Achieves greater clarity with improved planning of topics and is reader-friendly Deals with the mathematical techniques which will help readers to more efficient problem solving Explains a structured approach for mathematical derivations A reference book for academicians and scientific investigators
Ram Yatan Prasad, PhD, DSc (India), DSc (hc) Colombo, is a Professor of Chemistry and former Vice Chancellor of S.K.M University, Jharkhand, India. Pranita, PhD, DSc (hc) Sri Lanka, FICS, is an Assistant Professor of Chemistry at Vinoba Bhave University, India.

Volume 1, Advances in the Understanding of Nanomaterials Research and Applications

A Textbook of Strength of Materials

Evaluating Strategies for Commercialization and Sustainability

Chemical Process Calculations

Fungal Nanobionics: Principles and Applications

Microbial Biosurfactants

Fungal nanobionics has great prospects for developing new products with industrial, agriculture, medicine and consumer applications in a wide range of sectors. The fields of chemical engineering, agri-food, biochemical, pharmaceuticals, diagnostics and medical device development all employ fungal products, with fungal nanomaterials currently used in a wide range of applications, ranging from drug development to food industry and agricultural sector. The fungal agents emerge as an environmentally friendly, clean, non-toxic agent for the biogenic metal nanoparticles and employs both intracellular and extracellular methods. The simplicity of scaling up and downstream processing and the presence of fungal mycelia affording an increased surface area provide key advantages. In addition, the larger spectrum of synthesized nanoparticle morphologies and the substantially faster biosynthesis rate in cell-free filtrate (due to the higher amount of proteins secreted

in fungi) make this a particularly enticing route. Understanding the diversity of fungi in assorted ecosystems, as well as their interactions with other microorganisms, animals and plants, is essential to underpin real and innovative technological developments and the applications of metal nanoparticles in many disciplines including agriculture, catalysis, and biomedical biosensors. Importantly, biogenic fungal nanoparticles show significant synergistic characteristics when combined with antibiotics and fungicides to offer substantially greater resistance to microbial growth and applications in nanomedicine ranging from topical ointments and bandages for wound healing to coated stents.

Fuzzy logic techniques have had extraordinary growth in various engineering systems. The developments in engineering sciences have caused apprehension in modern years due to high-tech industrial processes with ever-increasing levels of complexity. *Advanced Fuzzy Logic Approaches in Engineering Science* provides innovative insights into a comprehensive range of soft fuzzy logic techniques applied in various fields of engineering problems like fuzzy sets theory, adaptive neuro fuzzy inference system, and hybrid fuzzy logic genetic algorithms belief networks in industrial and engineering settings. The content within this publication represents the work of particle swarms, fuzzy computing, and rough sets. It is a vital reference source for engineers, research scientists, academicians, and graduate-level students seeking coverage on topics centered on the applications of fuzzy logic in high-tech industrial processes.

This book explores the concept and methods of waste management with a new approach of biological valorization. Waste valorization is a process that aims to reduce, reuse, and recycle the waste into usable, value-added, and environmental benign raw materials which can be a source of energy. The book brings together comprehensive information to assert that waste can be converted into a resource or a raw material for value addition. Waste valorization imbibes the natural recycling principles of zero waste, loop closing, and underlines the importance of sustainable and environmentally friendly alternatives. Drawing upon research and examples from around the world, the book is offering an up-to-date account, and insight into the contours of waste valorization principles, biovalorization technologies for diverse group of wastes including agricultural, municipal, and industrial waste. It

further discusses the emerging paradigms of waste valorization, waste biorefineries, valorization technologies for energy, biofuel, and biochemical production. The book meets the growing global needs for a comprehensive and holistic outlook on waste management. It is of interest to teachers, researchers, scientists, capacity builders and policymakers. Also, the book serves as additional reading material for undergraduate and graduate students of biotechnology and environmental sciences.

Plant Nanobionics, Volume 2 continues the important discussion of nanotechnology in plants, but focuses with a focus on biosynthesis and toxicity. This book discusses novel approaches to biosynthesis of nanoparticles for the increase of plant production systems, controlled release of agrochemicals and management of plant biotic stress. Green biosynthesis of metallic nanoparticles from bee propolis, artificial photosynthesis and hybrid structures are presented. Although engineered nanoparticles have great potential for solving many agricultural and societal problems, their consequences on the ecosystems and environment must be responsibly considered. This volume aims to contribute to the limited literature on this topic through its comprehensive examination of nanoparticle toxicity on plants, microbes and human health. Environmental risks with recent data are discussed as well as risks associated with the transfer of nanoparticles through the food chain. This volume highlights the study of a mechanistic approach and the study of nanoparticles towards nanobionics. The application of polymeric materials for smart packing in the food industry and agriculture sector as well as the future of nanomaterials in detecting soil microbes for environmental remediation are also included.

GATE 12 Years' Solved Papers Year-wise 2010-2021 (For 2022 Exam)

Rules of Thumb for Chemical Engineers

PRINCIPLES OF MASS TRANSFER AND SEPERATION PROCESSES

Project Management - The Complete Process

CHEMISTRY IN DAILY LIFE

Application of Microbes in Environmental and Microbial Biotechnology