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Large scale cultivation of macrofungi is possible with fermentation, using easily accessible lignocellulosic agricultural residues applying economical methods to generate substantial biomass, food and biofuels. Bioconversion of lignocellulosic wastes by macrofungi generates value-added fungal nutritional biomass for humans and livestock. Besides commercial cultivation techniques, other topics covered in *Advances in Macrofungi: Industrial Avenues and Prospects* include: the healing potential of mushrooms, industrial opportunities, mycelium-based products, forest wild mushrooms and industrial applications of white rot fungi. This book reviews the industrial applications and uses of macrofungi. It encourages students and researchers to explore non-conventional sources of nutrition as well as bioactive metabolites to serve as nutraceuticals. It emphasizes the potential of macrofungi as a source of bioactive compounds to remedy human lifestyle diseases especially cancers and cardiovascular ailments along with immunostimulation potential by *Cordyceps*. This book emphasizes the role of mushrooms as a source of cosmeceuticals, flavors, essence, scents and perfumes.

Sustainable Bioprocessing for a Clean and Green Environment: Concepts and Applications highlights the importance of waste to health in which waste is safely converted to value-added products via bioprocess technologies. Providing fundamental concepts and applications, this book also offers readers the methodology behind the operation of a variety of biological processes used in developing valuable products from waste. Features: Discusses synthesis and use of environmentally friendly biobased materials, such as biopolymer films and biobased plasticizers Highlights nanotechnology applications in the treatment of pollution and emphasizes the synthesis of biogenic nanomaterials for environmental remediation Describes the use of biosurfactants and emerging algal technologies, such as applications of microalgae in nutraceuticals and biofuel production Details delignification for lignocellulosic biomass This interdisciplinary book offers researchers and practitioners in chemical engineering, environmental engineering, and related fields a broad perspective on fundamentals, technologies, and environmental applications of sustainable bioprocessing.

Environmental Science And Engineering Pertain To A Systematic Analysis Of The Natural And Man-Made World Encompassing Various Scientific, Economic, Social And Ethical Aspects. Human Impacts Leading To Large-Scale Degradation Of The Environment Have Aroused Global Concern On Environmental Issues In The Recent Years. The Apex Court Has Hence, Issued Directive To Impart Environmental Literacy To All. In This Book The Fundamental Concepts Of Environmental Science And Engineering Have Been Introduced And Analyzed In A Simple Manner Strictly As Per The Anna University

And Iiird Semester Syllabus. Besides The Undergraduate Students Of All Disciplines The Book Will Also Be Useful For Those Appearing In Various Competitive Exams Since Environmental Issues Now Find A Focus In Most Of Such Examinations. The Contents Of The Book Will Be Of Interest To All Educationists, Planners And Policy Makers. Key Features Of The Book Include A Simple And Holistic Approach With Illustrations, Tables And Specific Case Studies Mainly In The Indian Context. The Basic Terminologies Have Been Defined In The Text While Introducing The Topics And Some Useful Terms Mentioned In The Text Have Been Explained In The Glossary For An Easy Grasp By Students Of All Disciplines.

The International Conference on Emerging Trends in Engineering, Science and Technology (ICETEST) was held at the Government Engineering College, Thrissur, Kerala, India, from 18th to 20th January 2018, with the theme, "Society, Energy and Environment", covering related topics in the areas of Civil Engineering, Mechanical Engineering, Electrical Engineering, Chemical Engineering, Electronics & Communication Engineering, Computer Science and Architecture. Conflict between energy and environment has been of global significance in recent years. Academic research needs to support the industry and society through socially and environmentally sustainable outcomes. ICETEST 2018 was organized with this specific objective. The conference provided a platform for researchers from different domains, to discuss and disseminate their findings. Outstanding speakers, faculties, and scholars from different parts of the world presented their research outcomes in modern technologies using sustainable technologies.

Industrial Applications of Nanocrystals provides an overview of the properties and industrial applications of nanocrystalline materials. Nanocrystals are a major driver of technology and business in this century and hold the promise of high-performance materials that will significantly affect all aspects of society. Likewise, nanocrystals are driving development and innovation in numerous manufacturing sectors. However, complications keep nanocrystals from making a greater impact on manufacturing. The lack of information as well as the possibility of adverse influences on the environment, human health, safety, and sustainability are still major challenges. This book addresses these challenges for the use of nanomaterials in major manufacturing sectors. The aim of this book is to deliver advances in the use of nanocrystals across various industrial sectors. Chapter topics include approaches to the synthesis and green synthesis of nanocrystals, and the applications of nanocrystals in the pharmaceutical, biomedical, environmental, catalysis, electrochemical energy storage device, and emerging industries. Outlines major properties and industrial applications of nanocrystals for a variety of industrial sectors Describes the major processing techniques for nanocrystals Assesses the

major challenges to manufacturing nanocrystals on an industrial scale

Synergistic Approaches for Bioremediation of Environmental Pollutants: Recent Advances and Challenges focuses on the exploitation of various biological treatment technologies and their use to treat toxic contaminants present in industrial effluent and in restoring contaminated sites, which lacks in a more comprehensive manner in existing titles on similar topics available on the global market. The book comprises advanced biotechnologies and updated information, along with sustainable waste management developments and future directions for researchers and scientists working in the field of microbiology. Provides wide information to readers on the state-of-the-art in the application of biochar, microbes, and their synergistic use for wastewater/industrial effluent treatment and environment protection Summarizes current knowledge on the use of biochar and microbes, even dead biomass, for dye decolorization, degradation and removal of heavy metals which may play a key role in achieving a more productive and sustainable environment Explores different aspects of biological methods for contaminants removal for better insights into basic and advanced biotechnological applications Includes supplemented tables and figures

MXene, a two-dimensional (2D) transition metal carbide, nitride, and carbonitride, was discovered in 2011. MXene has great potential as a cocatalyst in the field of photocatalysis due to its unique properties and structure. **MXene-Based Photocatalysts: Fabrication and Applications** introduces readers to the fundamentals, preparation, microstructure characterization, and a variety of applications of MXene-based photocatalysts. The book is a comprehensive reference for MXene materials and provides an overview of the current literature on MXene-based photocatalysts. **FEATURES** Discusses preparation methods of MXenes Describes the morphology and microstructure of MXenes Offers strategies for fabricating MXene-based photocatalysts Details the reaction mechanism of MXene-based photocatalysts Covers applications in photocatalytic water-splitting, photocatalytic CO₂ reduction, photocatalytic degradation, photocatalytic nitrogen fixation, and photocatalytic H₂O₂ production This book serves as an invaluable guide for advanced students, industry professionals, professors, and researchers in the field of materials science and engineering, photocatalysis, energy, and environmental applications.

This interdisciplinary book incorporates various aspects of environment, ecology, and natural disaster management including cognitive informatics and computing. It fosters research innovation and discovery on basic science and information technology for addressing various environmental problems, while providing the right solutions in environment, ecology, and disaster management. This book is a unique resource for researchers and practitioners of energy informatics in various scientific, technological, engineering, and social fields to disseminate original research on the application of digital technology and information management theory and practice to facilitate the global transition toward sustainable and resilient energy systems. Cognitive informatics is also the need of the hour and deals with cutting-edge and multidisciplinary research area that tackles the fundamental problems shared by modern informatics, computation, software engineering, AI, cybernetics, cognitive science, neuropsychology, medical science, systems science, philosophy, linguistics, economics, management science, and life sciences, which this book also presents.

The purpose of this workshop is to spread the vast amount of information available on semiconductor physics to every possible field throughout the scientific community. As a result, the latest find-

ings, research and discoveries can be quickly disseminated. This workshop provides all participating research groups with an excellent platform for interaction and collaboration with other members of their respective scientific community. This workshop's technical sessions include various current and significant topics for applications and scientific developments, including • Optoelectronics • VLSI & ULSI Technology • Photovoltaics • MEMS & Sensors • Device Modeling and Simulation • High Frequency/ Power Devices • Nanotechnology and Emerging Areas • Organic Electronics • Displays and Lighting Many eminent scientists from various national and international organizations are actively participating with their latest research works and also equally supporting this mega event by joining the various organizing committees.

Advances in Chemical Engineering serial, Volume 60 highlights new advances in the field with this new volume presenting interesting chapters. Each chapter is written by an international board of authors. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the **Advances in Chemical Engineering** series Includes the latest information on the **Circular Economy: Closing the Loop with Chemical Recycling of Solid Plastic Waste**

Environmental Science is one of the most important areas of research and study in present time and its application in every aspect of life has also increased . Keeping this in view, almost all Indian Universities have introduced it as a compulsory course. This book is intended to suit the needs of graduate and postgraduate students pursuing environmental studies. To save the natural environment, a good and effective understanding of environmental science is needed. Environmental science is a term that has been widely used in recent years and its manifestations can range from environmental awareness learning through complex and expensive environmental study to operational research studies of environmental education systems.

This timely book covers various aspects of abiotic stress-resilient plants, including stress responses in plants and the progress made so far in the trait improvements, as well as integrating knowledge gained from basic physiology and discussing key genes, proteins, and metabolites for developing improved crop varieties.

QRS for BDS 1st Year is an extremely exam-oriented book. The book contains a collection of the last 10 15 years' solved questions of General Human Anatomy, Embryology and Histology; Human Physiology and Biochemistry; and Dental Anatomy, Embryology and Oral Histology in accordance with the new syllabus of BDS 1st year. The book will serve the requirements of BDS 1st year students to prepare for their examinations and help PG aspirants in quick review of important topics. It would also be helpful for PG students in a quick rush through the preclinical subjects About the Author : - Dr. Jyotsna Rao, is a senior faculty, currently working as an Associate Professor (Reader) in the Department of Oral and Maxillofacial Surgery, The Oxford Dental College, Hospital and Research Centre, Bangalore. She is also the founder and chairperson of Raghasai Institute of Postgraduate Entrance Examinations (RIPEE), Bangalore. Dr Rao has immense experience in teaching undergraduate and postgraduate students. She also keeps herself actively involved in researching innovative and practical ways of coaching the budding professionals for various state and national level postgraduate entrance examinations.

Environmental Resilience and Transformation in Times of COVID-19: Climate Change Effects on Environmental Functionality is a timely reference to better understand environmental changes amid the COVID-19 pandemic and the associated lockdowns. The book is organized into five themes: (1) environmental modifications, degradation, and human health risks; (2) water resources—planning, management, and governance; (3) air quality—monitoring, fate, transport, and drivers of socioenvironmental change; (4) marine and lacustrine environment; and (5) sustainable development goals and environmental justice. These themes provide an insight into the impact of COVID-19 on the environment and vice versa, which will help improve environmental management and planning, as well as influence future policies. Featuring many case studies from around the globe, this book offers a crucial examination of the intersectionality between climate, sustainability, the environment, and public health for researchers, practitioners, and policymakers in environmental science. Features global case studies to illustrate themes and address issues to support environmental management Offers fundamental and practical understanding of ways to improve and validate predictive abilities and tools in addition to response Examines climate-related trends in the spread of the pandemic Presents different ways forward in order to achieve global goals with a specific focus on SDGs

Environmental Management: Science and Engineering for Industry consists of 18 chapters, starting with a discussion of International Environmental Laws and crucial environmental management tools, including lifecycle, environmental impact, and environmental risk assessments. This is followed by a frank discussion of environmental control and abatement technologies for water, wastewater, soil, and air pollution. In addition, this book also tackles Hazardous Waste Management and the landfill technologies available for the disposal of hazardous wastes. As managing environmental projects is a complex task with vast amounts of data, an array of regulations, and alternative engineering control strategies designed to minimize pollution and maximize the effect of an environmental program, this book helps readers further understand and plan for this process. Contains the latest methods for Identifying, abating, or eliminating pollutants from air, water, and land Presents up-to-date coverage on environmental management tools, such as risk assessment, energy management and auditing, environmental accounting, and impact assessments Includes methods for collecting and synthesizing data derived from environmental assessments

This book focuses on the conventional breeding approach, and on the latest high-throughput genomics tools and genetic engineering / biotechnological interventions used to improve rice quality. It is the first book to exclusively focus on rice as a major food crop and the application of genomics and genetic engineering approaches to achieve enhanced rice quality in terms of tolerance to various abiotic stresses, resistance to biotic stresses, herbicide resistance, nutritional value, photosynthetic performance, nitrogen use efficiency, and grain yield. The range of topics is quite broad and exhaustive, making the book an essential reference guide for researchers and scientists around the globe who are working in the field of rice genomics and biotechnology. In addition, it provides a road map for rice quality improvement that plant breeders and agriculturists can actively consult to achieve better crop production.

A directory to the universities of the Commonwealth and the handbook of their association.

About the Book: Environmental Science pertain to a systematic analysis of the natural and man-made world encompassing various scientific, economic, social and ethical aspects. Human impacts

leading to large scale degradation of the environment have aroused global concern on environmental issues in the recent years. The apex court has hence, issued directive to impart environmental literacy to all. In this book the fundamental concepts of environmental studies have been introduced and analysed in a simple manner strictly as per the module syllabus designed by the U.G.C. for undergraduate courses in science, humanities, engineering, medicine, pharmacy, commerce, management and law. Besides the undergraduate students of all disciplines the book will also be useful for those appearing in various competitive exams since environmental issues now find a focus in most of such examinations. The contents of the book will be of interest to all educationists, planners and policy makers. Key features of the book include a simple and holistic approach with illustrations, tables and specific case studies mainly in the Indian context. The basic terminologies have been defined in the text while introducing the topics and some useful terms mentioned in the text have been explained in the glossary for an easy grasp by students of all disciplines.

Hydrogels are very important for biomedical applications because they can be chemically manipulated to alter and control the hydrogel's interaction with cells and tissues. Their flexibility and high water content is similar to that of natural tissue, making them extremely suitable for biomaterials applications. Biomedical hydrogels explores the diverse range and use of hydrogels, focusing on processing methods and novel applications in the field of implants and prostheses. Part one of this book concentrates on the processing of hydrogels, covering hydrogel swelling behaviour, superabsorbent cellulose-based hydrogels and regulation of novel hydrogel products, as well as chapters focusing on the structure and properties of hydrogels and different fabrication technologies. Part two covers existing and novel applications of hydrogels, including chapters on spinal disc and cartilage replacement implants, hydrogels for ophthalmic prostheses and hydrogels for wound healing applications. The role of hydrogels in imaging implants in situ is also discussed. With its distinguished editor and international team of contributors, Biomedical hydrogels is an excellent reference for biomedical research scientists and engineers in industry and academia, as well as others involved in research in this area, such as research clinicians. Examines the diverse range and use of hydrogels, focusing on processing methods and novel applications Comprehensive book explores the structure and properties of hydrogels and different fabrication technologies Covers important areas such as processing of hydrogels, covering hydrogel swelling behaviour, superabsorbent cellulose-based hydrogels and regulation of novel hydrogel products

Modern Media, Elections and Democracy explores how the modern media functions in a democracy, especially during elections, when it performs the crucial role of educating people and moulding public opinion. At such times, it becomes an arena for public debate and sometimes even a check against the abuse of power. The book analyses the constraints that curb the immense power of the media. It takes up issues that restrict free political debate and, in response, studies the statutory provisions that defend and protect freedom of expression. In this context, the author refers to many legal suits, case studies, jurisprudence governing election coverage, international standards for media practices, and so on. The book identifies ways in which various forms of media exert influence on politics and argues that the modern media—in all its forms—is expanding the scope of political pluralism.

Biodegradable Polymers, Blends and Composites provides a comprehensive review on recent devel-

opments in this very important research field. The book's chapters cover the various types of biodegradable polymers currently available and their composites, with discussions on preparation, properties and applications. Sections cover natural rubber-based polymer blends, soy-protein, cellulose, chitin, starch-based, PLA, PHBV, PCL, PVA, PBAT-based blends, Poly (ethylene succinate), PHB and Poly (propylene carbonates). The book will be a valuable reference resource for academic and industrial researchers, technologists and engineers working on recent developments in the area of biodegradable polymers, their blends and composites. Discusses the various types of biodegradable polymers, blends and composites Covers natural rubber, cellulose, chitin, starch, PLA, PCL and PBAT Features modern processing technologies, properties, applications and biodegradability

Green Sustainable Process for Chemical and Environmental Engineering and Science: Solvents for the Pharmaceutical Industry aims at providing a detailed overview of applications of green solvents in pharmaceutical industries. It also focuses on providing a detailed literature survey on the green solvents for pharmaceutical analysis, drug design, synthesis, and production, etc. It summarizes the applications of various green solvents such as water, cyrene, vegetable oils, ionic liquids, ethyl lactate, eutectic solvents, and glycerol in contrast to toxic solvents. This book provides an overview of the use of green solvents for the sustainable and environmentally friendly development of synthetic methodologies for biomedical and pharmaceutical industries. Up-to-date developments towards the development of solvents for pharmaceutical industry Includes latest advances in pharmaceutical analysis and synthesis using green solvents Outlines eco-friendly green solvents for medicinal applications State-of-the-art overview on the exploration of green solvents for pharmaceutical industries This book consolidates and summarizes smart technologies like IoT, edge computing, and AI used in different aspects of waste material management, mitigation, and recycling for a sustainable environment. One of the cases explains how IoT-based systems and wireless sensors can be used to continuously detect common pollutants such as volatile organic compounds (VOCs), carbon monoxide, and particulate matter (PM) and how the data collected are used to assess the overall air quality and determine actions for improvements. A collection of practical case studies, this book provides a comprehensive knowledge in smart waste management to readers in universities, research centers, and industries.

Over the past decade the world has seen the rise of the fascinating and diverse field currently recognized as nanotechnology. This book covers a broad spectrum of topics within nanotechnology, including synthesis techniques, various innovative characterization techniques, growth mechanisms of nanomaterials, the physics and chemistry of nanomaterials, diverse functionalization methods, and the various applications of nanomaterials in biology, therapeutics, energy, food science, and environmental science. It also discusses applications of nanostructured materials, integrative applications such as nano- and micro-electronic sensor devices, as well as agricultural and environmental remediation applications. The book also includes a discussion of advances in functionalized nanomaterials (0D, 1D, 2D and 3D) and covers the early stages of the development of functionalized nanostructures, considering the future for 2D nanomaterials and 3D objects. Additionally, it includes a chapter on nanomaterial research development that highlights work on the life-cycle analysis of nanostructured materials and toxicity aspects. This book proves useful for researchers and professionals working in the field of nanomaterials and green technology, as well as in the field of nanotechnology. It

should be useful to students and specialized researchers in a number of disciplines ranging from biology, chemistry, and materials science to engineering and manufacturing in both academia and industry.

Examination is as old as education itself. The examination process is the past phase of teaching and learning. Traditionally, the examination, has been a very tough exercise, fearful enough for students. However, with changing times, the procedure of conventional examination has changed. Now, the modern concept of examination is quite progressive and scientific. The educationists have introduced new terms like evaluation and measurement. Under evaluation, the level of knowledge and learning is weighted and under measurement, a learner is gauged and allotted score of marks.

This book provides innovative ideas on achieving sustainable development and using green technologies to conserve our ecosystem. Innovation is the successful exploitation of a new idea. Through innovation, we can achieve MORE while using LESS. Innovations in science & technology will not only help mankind as a whole, but also contribute to the economic growth of individual countries. It is essential that the global problem of environmental degradation be addressed immediately, and thus, we need to rethink the concept of sustainable development. Indeed, new environmentally friendly technologies are fundamental to attaining sustainable development. The book shares a wealth of innovative green technological ideas on how to preserve and improve the quality of the environment, and how to establish a more resource-efficient and sustainable society. The book provides an interdisciplinary approach to addressing various technical issues and capitalizing on advances in computing & optimization for scientific & technological development, smart information, communication, bio-monitoring, smart cities, food quality assessment, waste management, environmental aspects, alternative energies, sustainable infrastructure development, etc. In short, it offers valuable information and insights for budding engineers, researchers, upcoming young minds and industry professionals, promoting awareness for recent advances in the various fields mentioned above.

This new volume, *Microscopy Applied to Materials Sciences and Life Sciences*, focuses on recent theoretical and practical advances in polymers and their blends, composites, and nanocomposites related to their microscopic characterization. It highlights recent accomplishments and trends in the field of polymer nanocomposites and filled polymers related to microstructural characterization. This book gives an insight and better understanding into the development in microscopy as a tool for characterization. The book emphasizes recent research work in the field of microscopy in life sciences and materials sciences mainly related to its synthesis, characterizations, and applications. The book explains the application of microscopic techniques in life sciences and materials sciences, and their applications and state of current research carried out. The book aims to foster a better understanding of the properties of polymer composites by describing new techniques to measure microstructure property relationships and by utilizing techniques and expertise developed in the conventional filled polymer composites. Characterization techniques, particularly microstructural characterization, have proven to be extremely difficult because of the range of length-scales associated with these materials. Topics include: •Instrumentation and Techniques: advances in scanning probe microscopy, SEM, TEM, OM. 3D imaging and tomography, electron diffraction techniques and analytical microscopy, advances in sample preparation techniques in-situ microscopy, correlative microscopy in life and material sciences, low voltage electron microscopy. •Life Sciences: Structure and

imaging of biomolecules, live cell imaging, neurobiology, organelles and cellular dynamics, multi-disciplinary approaches for medical and biological sciences, microscopic application in plants, microorganism and environmental science, super resolution microscopy in biological sciences. •Materials Sciences: materials for nanotechnology, metals alloys and inter-metallic, ceramics, composites, minerals and microscopy in cultural heritage, thin films, coatings, surfaces and interfaces, carbon based materials, polymers and soft materials and self-assembled materials, semiconductors and magnetic materials. Polymers and inorganic nanoparticles. The volume will be of significant interest to scientists working on the basic issues surrounding polymers, nanocomposites, and nanoparticulate-filled polymers, as well as those working in industry on applied problems, such as processing. Because of the multidisciplinary nature of this research, the book will be valuable to chemists, materials scientists, physicists, chemical engineers, and processing specialists who are involved and interested in the future frontiers of blends.

The second book of the Food Biotechnology series, *Functional Foods and Biotechnology: Biotransformation and Analysis of Functional Foods and Ingredients* highlights two important and interrelated themes: biotransformation innovations and novel bio-based analytical tools for understanding and advancing functional foods and food ingredients for health-focused food and nutritional security solutions. The first section of this book provides novel examples of innovative biotransformation strategies based on ecological, biochemical, and metabolic rationale to target the improvement of human health relevant benefits of functional foods and food ingredients. The second section of the book focuses on novel host response based analytical tools and screening strategies to investigate and validate the human health and food safety relevant benefits of functional foods and food ingredients. Food biotechnology experts from around the world have contributed to this book to advance knowledge on bio-based innovations to improve wider health-focused applications of functional food and food ingredients, especially targeting non-communicable chronic disease (NCD) and food safety rele-

vant solution strategies. Key Features: Provides system science-based food biotechnology innovations to design and advance functional foods and food ingredients for solutions to emerging global food and nutritional insecurity coupled public health challenges. Discusses biotransformation innovations to improve human health relevant nutritional qualities of functional foods and food ingredients. Includes novel host response-based food analytical models to optimize and improve wider health-focused application of functional foods and food ingredients. The overarching theme of this second book is to advance the knowledge on metabolically-driven food system innovations that can be targeted to enhance human health and food safety relevant nutritional qualities and antimicrobial properties of functional food and food ingredients. The examples of biotransformation innovations and food analytical models provide critical insights on current advances in food biotechnology to target, design and improve functional food and food ingredients with specific human health benefits. Such improved understanding will help to design more ecologically and metabolically relevant functional food and food ingredients across diverse global communities. The thematic structure of this second book is built from the related initial book, which is also available in the Food Biotechnology Series *Functional Foods and Biotechnology: Sources of Functional Food and Ingredients*, edited by Kalidas Shetty and Dipayan Sarkar (ISBN: 9780367435226) For a complete list of books in this series, please visit our website at: <https://www.crcpress.com/Food-Biotechnology-Series/book-series/CRCFOOBIOTECH> This book presents selected papers from the 7th International Conference on Advances in Energy Research (ICAER 2019), providing a comprehensive coverage encompassing all fields and aspects of energy in terms of generation, storage, and distribution. Themes such as optimization of energy systems, energy efficiency, economics, management, and policy, and the interlinkages between energy and environment are included. The contents of this book will be of use to researchers and policy makers alike.