FUNDAMENTALS AND APPLICATIONS OF CHEMISTRY

EXAM PREPARATION GUIDE

Dr. R. S. S. Srikanth Vemuri

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Fundamentals and Applications of Chemistry: Exam Preparation Guide

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Author

Dr. R. S. S. Srikanth Vemuri

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For Sales Enquiries:
Contact: +91- 8861511583
E-mail: sales@iipbooks.com

Dedicated To

This book is dedicated to my parents and my wife, whose unwavering support, love, and encouragement have been my greatest sources of strength. Their belief in me has made this journey possible, and for that, I am eternally thankful.

Preface

This book, "Fundamentals and Applications of Chemistry: Exam Preparation Guide," is designed to serve as a comprehensive resource for first-year Bachelor of Technology (B. Tech) students specializing in Electrical and Electronics Engineering (EEE), Electronics and Communication Engineering (ECE), Computer Science and Engineering and allied branches (CSE, CAI, CSM, CSC & CSD) and Information Technology (IT). It aims to provide a thorough understanding of key concepts in chemistry, tailored to meet the curriculum requirements of JNTU - GV.

Chemistry is a foundational science that plays a crucial role in various engineering disciplines. From the principles governing molecular interactions to the applications of advanced materials, a solid grasp of chemistry is essential for engineering students. This guide is structured to facilitate both learning and revision, ensuring students are well-prepared for their examinations.

The book comprises a rich collection of questions that cover a wide array of topics, including quantum mechanics, electrochemistry, polymers, and spectroscopy. These questions are crafted to assess and enhance students' understanding of basic principles and their ability to apply this knowledge in practical scenarios.

Each chapter delves into a specific area of chemistry, providing opportunities for detailed exploration and critical thinking. By engaging with these questions, students will develop a deeper understanding of both the theoretical and practical aspects of chemistry. The content is designed to not only prepare students for their exams but also to cultivate a comprehensive understanding that will be beneficial throughout their engineering careers.

This book emphasizes the applications of chemistry in real-world scenarios, demonstrating the relevance of chemical principles in engineering and technology. By integrating theoretical knowledge with practical examples, students can appreciate the importance of chemistry in their chosen field.

Chemistry is more than an academic subject; it is a lens through which we can understand the world and innovate for the future. The ability to analyze materials, comprehend reaction mechanisms, and apply this knowledge to solve practical problems is crucial in various engineering disciplines. This book aims to bridge the gap between theoretical principles and practical applications, fostering a deeper appreciation and understanding of the subject.

I have meticulously compiled this guide to ensure it aligns with the latest curriculum and pedagogical standards. Each chapter is structured to build on previous knowledge, gradually advancing to more complex concepts. The inclusion of diverse question types aims to enhance critical thinking and problem-solving skills, preparing students not only for exams but also for real-world engineering challenges.

I hope this book will serve as a valuable tool for students, helping them build a strong foundation in chemistry and excel in their examinations. Whether used as a primary study resource or a supplementary revision guide, it is designed to support students in their academic journey and foster a lifelong appreciation for the fascinating world of chemistry.

- Dr. R. S. S. Srikanth Vemuri

Acknowledgement

I would like to express my deepest gratitude to the Principal of Vignan's Institute of Engineering for Women for their continuous support and encouragement throughout the development of this book. Their dedication to fostering an environment of academic excellence has been truly inspiring.

I am also profoundly grateful to the Head of the Basic Sciences and Humanities Department for their invaluable guidance and assistance. Their expertise and commitment have been instrumental in shaping the content and direction of this work.

Contents

ABOUT THE AUTHOR

Dr. R. S. S. Srikanth Vemuri is an accomplished Associate Professor at Vignan's Institute of Engineering for Women in Visakhapatnam, specializing in kinetics, surfactants, and electron transfer reactions. With a Ph.D. in Physical Chemistry from Andhra University and over ten years of teaching and research experience, he is dedicated to delivering high-quality education in Engineering Chemistry and Applied Chemistry. Dr. Vemuri has a robust research portfolio, including 20 published papers, contributions to international and national conferences, and a patent. His notable works include studies on surfactant- complex analysis and sustainable approaches for industrial wastewater treatment. In addition to his academic responsibilities, Dr. Vemuri is committed to professional development, having participated in numerous faculty development programs and obtained certifications in various fields such as chromatography and data science. He has been recognized with several awards, including the Young Scientist Award by VD GOOD Organization in 2021. Dr. Vemuri's passion for teaching is reflected in his focus on fostering interactive classroom discussions and mentoring students. His proficiency in multiple languages, strong communication skills, and strategic planning abilities further enhance his contributions to academia.

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