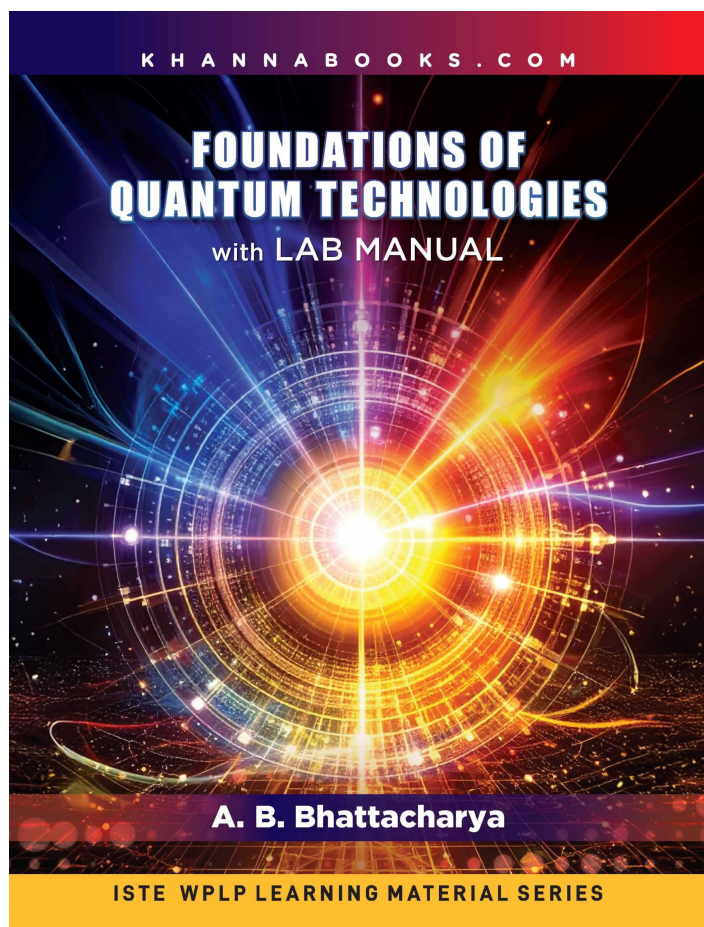




Foundations of Quantum Technology with Lab Manual

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Product Description

Foundations of Quantum Technology with Lab Manual Explore the Future — Learn the Fundamentals —

Master the Tools Step into the next revolution in science and technology with Foundations of Quantum Technologies (with Lab Manual) — an all-encompassing guide designed for students, educators, and researchers aiming to understand and work with the principles and real-world applications of quantum mechanics. **WHAT'S INSIDE** **Part I: Fundamentals of Quantum Mechanics** Begin your journey with a deep dive into the origin and evolution of quantum theory. Understand wave-particle duality, measurement postulates, and the ground-breaking concept of quantum entanglement. Enrich your learning with multiple-choice questions, solved numerical problems, and project ideas at the end of each chapter. **Part II: Core Quantum Technologies** From quantum computing and cryptography to teleportation and metrology, discover how abstract quantum principles power the innovations shaping tomorrow. Learn algorithms like Shor's and Grover's, and explore secure communication via the BB84 Protocol. **Part III: Experimental and Practical Aspects** Get hands-on with quantum hardware platforms like superconducting qubits, trapped ions, and photonic systems. Study experimental realizations from IBM Q, Google Sycamore, and more. It includes detailed insights into quantum gate implementation and optical elements in labs. **Part IV: Lab Manual** Bridge theory with practice in your own quantum lab. Conduct real-world experiments on polarization, entanglement, BB84 protocol, and quantum algorithms using cloud platforms. Learn essential tools like QuTiP, Qiskit, and Cirq for simulating and analyzing quantum systems. **Also Includes**

- Conceptual short Q&A
- MCQs and numerical problems with solutions
- Design-driven project tasks
- Oral questions for viva preparation
- Reference tables for quick access

Whether you're a curious beginner or an aspiring quantum researcher, this book offers a robust, intuitive, and experimentally rich learning experience to help you navigate the quantum frontier.

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Khanna Publishing House

4C/4344, Ansari Road, Daryaganj, New Delhi-110002

Email: contact@khannabooks.com | Tel: 011-2324 44 47 - 48 | Mobile: + 91-99109 09320

Author

Prof. A. B. Bhattacharya, Pro-Vice-Chancellor of JIS University, did his M. Sc. and Ph. D. degree in Physics from the University of Calcutta. He did his Post-doc from the Massachusetts Institute of Technology, USA and subsequently joined in the Department of Physics, Kalyani University. He has published 256 Research papers in high-impact Journals and over 150 proceeding papers in conferences. He has successfully guided 24 scholars for their Ph.D. and has written a large number of invited articles in many Journals. He is the author of 29 textbooks written for engineering and science students and also for general readers from many reputed publishers like Infinity Science Press, Taylor & Francis, etc. International Institute of Success Awareness honored him with their most coveted Institutional and globally reputed “Glory of India Gold Medal” for remarkable contributions to India’s national prestige. He is a Life Fellow of the Institution of Electronics and Telecommunication Engineers.
