



QUANTUM PHYSICS

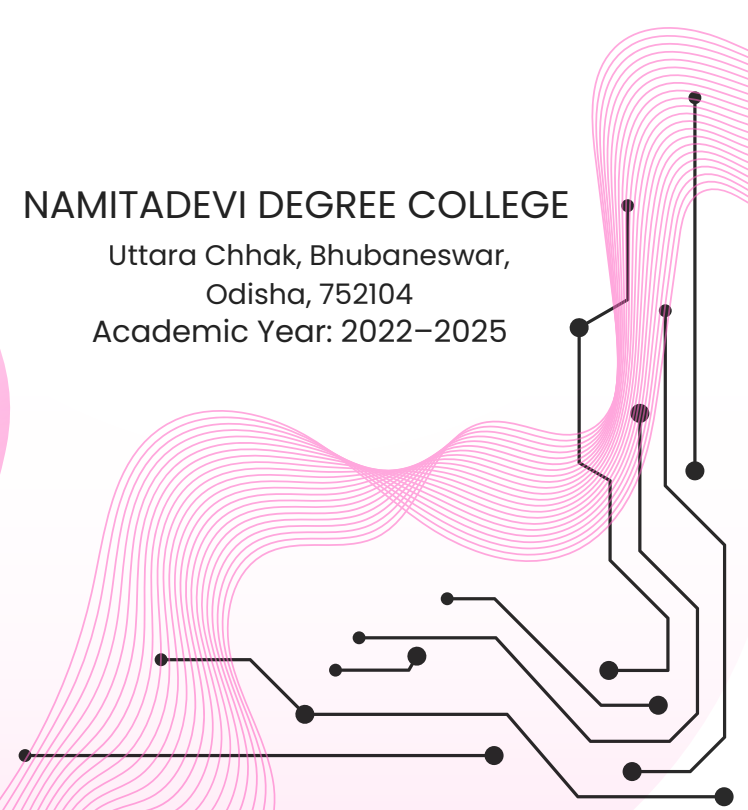
ITS REAL-WORLD APPLICATIONS

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CERTIFICATE

This is certify that the project entitled "**Quantum Physics And Its Real-World Applications**" is a record of Bonafide project work carried out by **Mohammed Shahrukh Alam**, under the guidance of A Head of the Department **Karishma Das**, Department of Physics, Namitadevi Degree College, Bhubaneswar for the partial fulfilment of project submission under the Discipline Specific Elective IV(DSE-IV), being conducted by the college.

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ABSTRACT

This project explores the fascinating world of Quantum Physics—a field that revolutionized our understanding of nature at the microscopic level. Beginning with its historical evolution and key discoveries, the project highlights the fundamental principles such as wave-particle duality, uncertainty principle, superposition, and quantum entanglement.

A significant focus is placed on the mathematical framework of quantum mechanics, including operators, wave functions, and the Schrödinger equation. Through carefully chosen real-world case studies, the project demonstrates how quantum theory is not merely theoretical, but deeply integrated into modern technology—ranging from semiconductors, lasers, and quantum dots to groundbreaking developments like quantum computing, cryptography, and quantum teleportation.

The aim of this project is to bridge the gap between complex quantum theory and its practical applications, allowing readers to appreciate how quantum mechanics underpins much of today's scientific advancement. With supporting diagrams, examples, and ethical considerations, this report offers a comprehensive insight into how quantum physics continues to shape the future of technology and human understanding.