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B.Tech Engineering is a four-year undergraduate program with a strong focus on theoretical physics subjects such as Advanced Classical Mechanics, Signals and Systems, Semiconductor Devices, and Electromagnetism. In addition to theory classes, the course includes several laboratory sessions covering topics like Chemistry Laboratory, Computing Laboratory, Physics Laboratory, and Electronics Lab. The curriculum also prepares students for postgraduate studies in Physics, with optional courses leading to M.Sc or Ph.D. degrees. Management Elective - VI Elective - IV Elective - VII Elective - V Project Seminar - Project - B Tech Engineering Physics Electives Fiber Optics Atmospheric and Environmental Physics Optical Engineering Thin film technology Unconventional Electronics Introduction to Optoelectronics Relativity and Gravitation Nano Photonics Light-Matter interaction in Resonators Introduction to Critical phenomena B Tech Engineering Physics Subjects Quantum Mechanics Quantum Mechanics topics include Dirac formalism, Born interpretation, measurement theory, time evolution, Schrödinger equation, applications to simple systems, semi-classical approaches like WKB method and rotations. References include J. D. Ryder's "Numerical Recipes in C: The Art of Scientific Programming" and W. H. Press et al.'s "Modern Quantum Mechanics". Other notable texts include "Physics of Atoms and Molecules" by J. J. Sakurai. Regarding B Tech Engineering Physics colleges, the list includes: * Indian Institute of Technology, Roorkee (Annual Fees: 2,13,000, Placement Package: 14,60,000) * Indian Institute of Technology, Delhi (Annual Fees: 2,19,000, Placement Package: 16,00,000) * Indian Institute of Technology, Bombay (Annual Fees: 2,11,400, Placement Package: 9,00,000) * Indian Institute of Technology, Guwahati (Annual Fees: 2,15,000, Placement Package: 11,00,000) The B Tech Engineering syllabus covers subjects like Systems and Networks, Semiconductors Devices, Quantum Mechanics, Advanced Classical Mechanics, Signals, Analogue & Digital Electronics, etc. Engineering Physics has a scope, allowing students to pursue careers in telecommunication, informative sciences, microelectronics, optoelectronics, laser information systems, or quantum information systems. The course is available at four IITs - Delhi, Bombay, Madras, and Guwahati. The Engineering Physics program provides a foundation in mathematics and physics, along with engineering design and problem-solving skills. Students can choose from various fields like electrical, mechanical, civil engineering, and computer science after completing the degree. Engineering Physics teaches principles of Science for designing equipment involving electronics, electro-mechanical systems, measurements, communications, data acquisition, optics, nano synthesis, photovoltaics, and nanofabrication. After completing the Engineering Physics program, students can pursue various job options such as Aerospace Engineer, Civil Engineer, etc. Engineering Physics is a challenging course that covers multiple aspects of various industries, unlike most engineering courses which focus on one specific industry. Students who wish to become space scientists at ISRO (Indian Space Research Organization) should pursue an engineering or science course, and usually, ISRO hires professionals with a master's in mechanical, electrical, or PhD in Astronomy, Physics, computer engineering, or Mathematics. The B Tech Engineering Physics degree can lead to excellent job opportunities in companies like Microsoft, Vikram Sarabhai Space Center, and the Indian Space Research Organization (ISRO). The course syllabus consists of several modules: Module 1: Wave Nature of Particles and Schrodinger Equation - This module covers the basics of quantum mechanics, wave-particle duality, and the Schrodinger equation. Module 2: Wave Optics - Students learn about Huygens' principle, superposition of waves, interference of light, Young's double slit experiment, and diffraction gratings. Module 3: Introduction to Solids - This module covers free electron theory, density of states, Bloch's theorem, and energy bands in solids. Module 4: Lasers - Students learn about Einstein's theory of matter-radiation interaction, population inversion, different types of lasers, and their properties. Module 5: Electrostatics in Vacuum - This module covers electric field calculation, electrostatic potential, dielectrics, Maxwell's equations, and the Poynting vector. The course includes various experiments, such as determining the dispersive power of a prism, measuring the wavelength of sodium light using Newton's rings, and resolving power. 1. Young’s double slit Experiment for studying wave properties. 2. Measuring frequency of AC mains supply using specialized equipment. 3. Understanding V-I Characteristics of P-N junction diode and its behavior under different conditions. 4. Determining loss of light in single slit diffraction to analyze wavelength properties. 5. Calculating plank’s constant by analyzing photocell signals. 6. Hall’s effect experiment for studying electric field interactions with semiconductor materials. 7. Calibration method for ammeter using reference zener diode to ensure accuracy. 8. Investigating temperature effects on reverse saturation current in P-N junction diodes and energy band gap analysis. 9. Analyzing sodium wavelength using plane diffraction grating techniques. 10. Identifying prominent lines of mercury source by plane diffraction grating methods. 11. Determining numerical aperture of optical fibers through precise measurements. 12. Measuring wavelength of given laser using plane diffraction grating principles.

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