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This book on electrical, optical, magnetic and thermal properties of materials differs from other introductory texts in solid state physics. First, it is written for engineers, particularly materials and electrical engineers, who want to gain a fundamental understanding of semiconductor devices, magnetic materials, lasers, alloys, and so forth. Second, it stresses concepts rather than mathematical formalism. Third, it is not an encyclopedia: The topics are restricted to material considered to be essential and which can be covered in one 15-week semester. The book is divided into five parts. The first part, "Fundamentals of Electron Theory," introduces the essential quantum mechanical concepts needed for understanding materials science; the other parts may be read independently of each other. Many practical applications are discussed to provide students with an understanding of electronic devices currently in use. The solutions to the numerical problems are given in the appendix. Previous editions have been well received by students and teachers alike. This third edition has again been thoroughly revised and brought up to date to take into account the explosive developments in electrical, optical, and magnetic materials and devices. In particular, the book contains expanded sections on flat-panel displays (liquid crystals, electroluminescent devices, and field-emission and plasma displays) as well as discussions of recent developments in ferro- and piezoelectricity, magneto-optical memories, photonic and magnetoresistive devices, blue- and green-emitting LED's, and dielectric and thermoelectric properties.