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Nota di contenuto	Cover; Half Title page; Title page; Copyright page; Dedication; Preface; Acknowledgement; About the Authors; Abbreviations; Chapter 1: General Introduction to Electrical and Electronic Materials; 1.1 Importance of Materials; 1.2 Importance of Electrical and Electronic Materials; 1.3 Classification of Electrical and Electronic Materials; 1.4 Scope of Electrical and Electronic Materials; 1.5 Requirements of Engineering Materials; 1.6 Operational Requirements of Electrical and Electronic Materials; 1.7 Classification of Solids on the Basis of Energy Gap 1.8 Glimpse of Some Electronic Products, Their Working Principles and Choicest Materials 1.9 Different Types of Engineering Materials; 1.10 Different Levels of Materials Structure; 1.11 Spintronics (The Electronics of Tomorrow) and Spintronic Materials; 1.12 Ferromagnetic Semiconductor; 1.13 Left-Handed (LH) Materials; 1.14 Solved Examples; Chapter 2: Atomic Models, Bonding in Solids, Crystal Geometry, and Miller Indices; 2.1 Atomic Models; 2.2 Bohr's Quantum

Atomic Model; 2.3 Modern Concept of Atomic Model; 2.4 Electron Configuration; 2.5 Meaning of Chemical (or Atomic) Bonding 2.6 Classification of Chemical Bonds 2.7 Ionic Bond; 2.8 Covalent Bonds; 2.9 Monocrystalline and Polycrystalline Crystal Structures; 2.10 Space Lattice; 2.11 Basis; 2.12 Unit Cell and Crystal; 2.13 Bravais Crystal System; 2.14 Primitive and Non-Primitive Unit Cells; 2.15 Coordination Number; 2.16 Atomic Packing Fraction; 2.17 Calculation of Density (or Bulk Density); 2.18 Miller Indices; 2.19 Interplaner Spacing; 2.20 Linear Density; 2.21 Planer Density; Chapter 3: Solid Structures, Characterization of Materials, Crystal Imperfections, and Mechanical Properties of Materials 3.1 Crystallography 3.2 Crystalline and Non-Crystalline Structures; 3.3 Hexagonally Closed Packed Structure (HCP); 3.4 VOIDS; 3.5 Covalent Solids; 3.6 Bragg's Law of X-Rays Diffraction; 3.7 Structure Determination; 3.8 Microscopy; 3.9 Different Types of Metallurgical Microscopes and Their Features; 3.10 Working Principle of Electron Microscope; 3.11 Ideal and Real Crystals, and Imperfections; 3.12 Classification of Imperfections; 3.13 Point Imperfections; 3.14 Effects of Point Imperfections; 3.15 Line Imperfections; 3.16 Features of Edge Dislocation; 3.17 Screw Dislocation 3.18 Characteristics of Dislocations 3.19 Sources of Dislocations, Their Effects and Remedies; 3.20 Grain Boundary; 3.21 Twin or Twinning; 3.22 Mechanical Properties of Metals; Chapter 4: Conductive Materials: Electron Theories, Properties and Behaviour; 4.1 Electrons and Their Role in Conductivity; 4.2 Electron Theories of Solids; 4.3 Free Electron Theory; 4.4 Energy Band Theory; 4.5 Brillouin Zone Theory; 4.6 Conductors; 4.7 Factors Affecting Conductivity (and Resistivity) of Metals; 4.8 Thermal Conductivity; 4.9 Heating Effect of Current; 4.10 Thermoelectric Effect (or Thermoelectricity) 4.11 Seebeck Effect

Sommario/riassunto

This comprehensive and unique book is intended to cover the vast and fast-growing field of electrical and electronic materials and their engineering in accordance with modern developments. Basic and prerequisite information has been included for easy transition to more complex topics. Latest developments in various fields of materials and their sciences/engineering, processing and applications have been included. Latest topics like PLZT, vacuum as insulator, fiber-optics, high temperature superconductors, smart materials, ferromagnetic semiconductors etc. are covered. Illustrations and exa
