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Nota di contenuto	Front Cover; Calculations in Molecular Biology and Biotechnology; Copyright Page; Contents; Foreword; Chapter 1. Scientific Notation and Metric Prefixes; Introduction; Significant Digits; Rounding Off Significant Digits in Calculations; Exponents and Scientific Notation; Expressing Numbers in Scientific Notation; Converting Numbers from Scientific Notation to Decimal Notation; Adding and Subtracting Numbers Written in Scientific Notation; Multiplying and Dividing Numbers Written in Scientific Notation; Metric Prefixes; Conversion Factors and Canceling Terms Chapter 2. Solutions Mixtures and Media Introduction; Calculating Dilutions: A General Approach; Concentrations by a Factor of X; Preparing Percent Solutions; Diluting Percent Solutions; Moles and Molecular Weight: Definitions; Molarity; Diluting Molar Solutions; Converting Molarity to Percent; Converting Percent to Molarity; Normality; PH; pKa and the Henderson-Hasselbalch Equation; Chapter 3. Cell Growth; The Bacterial Growth Curve; Manipulating Cell Concentration; Plotting OD550 vs. Time on a Linear Graph; Plotting the

Logarithm of OD550 vs. Time on a Linear Graph
Plotting the Log of Cell Concentration vs. Time Calculating Generation Time; Plotting Cell Growth Data on a Semilog Graph; Determining Generation Time Directly from a Semilog Plot of Cell Concentration vs. Time; Plotting Cell Density versus OD550 on a Semilog Graph; The Fluctuation Test; Fluctuation Test Example; Variance; Measuring Mutation Rate; Measuring Cell Concentration on a Hemocytometer;
Chapter 4. Working with Bacteriophage; Introduction; Multiplicity of Infection; Probabilities and Multiplicity of Infection; Measuring Phage Titer; Diluting Bacteriophage; Measuring Burst Size
Chapter 5. Quantitation of Nucleic Acids Quantitation of Nucleic Acids by Ultraviolet Spectroscopy; Determining the Concentration of Double-Stranded DNA; Using Absorbance and an Extinction Coefficient to Calculate Double-Stranded DNA Concentration; Calculating DNA Concentration as a Millimolar (mM) Amount; Determining the Concentration of Single-Stranded DNA Molecules; Oligonucleotide Quantitation; Measuring RNA Concentration; Molecular Weight, Molarity, and Nucleic Acid Length; Estimating DNA Concentration on an Ethidium Bromide-Stained Gel
Chapter 6. Labeling Nucleic Acids with Radioisotopes Introduction; Using Radioactivity: The Curie; Estimating Plasmid Copy Number; Labeling DNA by Nick Translation; Random Primer Labeling of DNA; Labeling 3' Termini with Terminal Transferase; cDNA Synthesis; Homopolymeric Tailing; In Vitro Transcription; Chapter 7. Oligonucleotide Synthesis; Introduction; Synthesis Yield; Measuring Stepwise and Overall Yield by the DMT Cation Assay; Overall Yield; Stepwise Yield; Calculating Micromoles of Nucleoside Added at Each Base Addition Step; Chapter 8. The Polymerase Chain Reaction; Introduction
Template and Amplification

Sommario/riassunto

Calculations in Molecular Biology and Biotechnology: A Guide to Mathematics in the Laboratory is the first comprehensive guide devoted exclusively to calculations encountered in the genetic engineering laboratory. Mathematics, as a vital component of the successful design and interpretation of basic research, is used daily in laboratory work. This guide, written for students, technicians, and scientists, provides example calculations for the most frequently confronted problems encountered in gene discovery and analysis. The text and sample calculations are written in an easy-to-follow
