Contents

UNIT I: Protein Structure and Function

Chapter 1: Amino Acids 1

Chapter 2: Structure of Proteins 13
Chapter 3: Globular Proteins 25

Chapter 4: Fibrous Proteins 43

Chapter 5: Enzymes 53

UNIT II: Intermediary Metabolism

Chapter 6: Bioenergetics and Oxidative Phosphorylation 69

Chapter 7: Introduction to Carbohydrates 83

Chapter 8: Glycolysis 91

Chapter 9: Tricarboxylic Acid Cycle 109

Chapter 10: Gluconeogenesis 117

Chapter 11: Glycogen Metabolism 125

Chapter 12: Metabolism of Monosaccharides and Disaccharides 137

Chapter 13: Pentose Phosphate Pathway and NADPH 145

Chapter 14: Glycosaminoglycans, Proteoglycans, and Glycoproteins 157

UNIT III: Lipid Metabolism

Chapter 15: Metabolism of Dietary Lipids 173

Chapter 16: Fatty Acid and Triacylglycerol Metabolism 181

Chapter 17: Complex Lipid Metabolism 201

Chapter 18: Cholesterol and Steroid Metabolism 219

UNIT IV: Nitrogen Metabolism

Chapter 19: Amino Acids: Disposal of Nitrogen 245

Chapter 20: Amino Acid Degradation and Synthesis 261

Chapter 21: Conversion of Amino Acids to Specialized Products 277

Chapter 22: Nucleotide Metabolism 291

UNIT V: Integration of Metabolism

Chapter 23: Metabolic Effects of Insulin and Glucagon 307

Chapter 24: The Feed/Fast Cycle 321

Chapter 25: Diabetes Mellitus 337

Chapter 26: Obesity 349

Chapter 27: Nutrition 357

Chapter 28: Vitamins 373

UNIT VI: Storage and Expression of Genetic Information

Chapter 29: DNA Structure, Replication and Repair 395

Chapter 30: RNA Structure, Synthesis and Processing 417

Chapter 31: Protein Synthesis 431

Chapter 32: Regulation of Gene Expression 449

Chapter 33: Biotechnology and Human Disease 465

Index 489