Contents

UNIT I: Protein Structure and Function

Chapter 1: Amino Acids...1

Chapter 2: Protein Structure...13
Chapter 3: Globular Proteins...25
Chapter 4: Fibrous Proteins...43

Chapter 5: Enzymes...53

UNIT II: Bioenergetics and Carbohydrate Metabolism

Chapter 6: Bioenergetics and Oxidative Phosphorylation...69

Chapter 7: Introduction to Carbohydrates...83

Chapter 8: Introduction to Metabolism and Glycolysis...91

Chapter 9: Tricarboxylic Acid Cycle and Pyruvate Dehydrogenase Complex...109

Chapter 10: Gluconeogenesis...117
Chapter 11: Glycogen Metabolism...125

Chapter 12: Monosaccharide and Disaccharide Metabolism...137

Chapter 13: Pentose Phosphate Pathway and Nicotinamide Adenine Dinucleotide Phosphate...145

Chapter 14: Glycosaminoglycans, Proteoglycans, and Glycoproteins...157

UNIT III: Lipid Metabolism

Chapter 15: Dietary Lipid Metabolism...173

Chapter 16: Fatty Acid, Triacylglycerol, and Ketone Body Metabolism...181
Chapter 17: Phospholipid, Glycosphingolipid, and Eicosanoid Metabolism...201

Chapter 18: Cholesterol, Lipoprotein, and Steroid Metabolism...219

UNIT IV: Nitrogen Metabolism

Chapter 19: Amino Acids: Nitrogen Disposal...245

Chapter 20: Amino Acids: Degradation and Synthesis...261

Chapter 21: Amino Acids: Conversion 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

UNIT VI: Medical Nutrition

Chapter 27: Nutrition: Overview and Macronutrients...357

Chapter 28: Micronutrients: Vitamins...377
Chapter 29: Micronutrients: Minerals...399

UNIT VII: Storage and Expression of Genetic Information

Chapter 30: DNA Structure, Replication, and Repair...411
Chapter 31: RNA Structure, Synthesis, and Processing...433

Chapter 32: Protein Synthesis...447

Chapter 33: Regulation of Gene Expression...465
Chapter 34: Biotechnology and Human Disease...481

Appendix 505 Index 539 Figure Sources 567

Bonus chapter online! Chapter 35: Blood Clotting (Use your scratch-off code provided in the front of this book for access to this and other free online resources on the Point*.) (3) 1/2016