

Part I

- 1. Anatomy of the Cell and Organelles***
- 2. DNA Replication, Gene Mutations, and Repair***
- 3. Transcription and Regulation of Transcription***
- 4. Translation and Regulation of Translation***

Part II

- 5. Cytoskeleton***
- 6. Protein Sorting, Modifications, and Intracellular Traffic***
- 7. Membrane Transport***
- 8. Extracellular Matrix***
- 9. Cell Adhesion and Membrane Junctions***
- 10. Signal Transduction***
- 11. Cell Cycle and Control of the Cell Cycle***
- 12. Stem Cells and Hematopoiesis***
- 13. Cell Injury, Apoptosis, and Necrosis***
- 14. Hallmarks of Cancer and Cancer Biology***
- 15. Molecular Principles of Cancer Treatments and Therapies***

Part III

- 16. Enzymes and Enzyme Kinetics***
- 17. Regulation of Enzyme Activity***
- 18. Structure and Function of Proteins***
- 19. Molecular and Biological Techniques***
- 20. Plasma Proteins and the Diagnostic Use of Enzymes***

Part IV

- 21. Digestion and Absorption of Carbohydrates***
- 22. Glycolysis***
- 23. Metabolism of Fructose, Galactose and the Pentose Phosphate Pathway (HMP Shunt)***
- 24. Glycogen Metabolism and Regulation***
- 25. Gluconeogenesis***
- 26. Pyruvate Dehydrogenase and Tricarboxylic Acid (TCA) Cycle***
- 27. Electron Transport Chain (ETC) and Oxidative Phosphorylation***
- 28. Oxygen Toxicity and Antioxidants***
- 29. Oxidation of Fatty Acids and Ketogenesis***

30. Acid Base Chemistry and Acid Base Disorders

31. Glucose Homeostasis and Maintenance of Blood Glucose Concentrations

Part V

32. Digestion and Absorption of Proteins

33. Nitrogen Metabolism

34. Amino Acid Metabolism

35. Amino Acid Derivatives

36. Porphyrin Heme Metabolism and Iron Homeostasis

37. Nucleotide Metabolism

38. Vitamins in One-Carbon Metabolism

Part VI

39. Digestion and Absorption of Lipids

40. Synthesis of Fatty Acids and Triacylglycerols

41. Metabolism of Membrane Lipids and Lipid Derivatives

42. Cholesterol Metabolism

43. Blood Lipoproteins

44. Steroid Hormones and Vitamin D

45. Nutrition and Metabolism

46. Vitamins and Minerals

Part VII

47. DNA Packaging and Meiosis

48. Cytogenetics: Chromosomal Basis of Human Diseases

49. Single Gene Disorders: Autosomal Dominant and Recessive Inheritance

50. Sex-Linked and Non-Traditional Modes of Inheritance

51. Population Genetics

52. Genomic Imprinting and Epigenetics

53. Gene Interactions and Multifactorial Inheritance

54. Personalized Medicine

55. Developmental Genetics

56. Cancer Genetics