

Contents

<i>Foreword</i>	vii
<i>Preface</i>	ix
1. Fluids	1
➤ Lymph	1
➤ Cerebrospinal Fluid (SN/MCQ/Clinical Importance/Viva).....	1
➤ ASCITIC Fluid (SN/Clinical Importance).....	5
➤ Pleural Fluid (SN/Clinical Importance).....	7
➤ Pericardial Fluid	8
➤ Synovial Fluid	8
2. Metabolism of Special Tissues	11
➤ Metabolism of Muscle at Rest and During Exercise (SN/LN).....	11
➤ Bone Metabolism (SN)	17
➤ Biochemistry of Connective Tissue (SN).....	19
➤ Biochemistry of Human Brain (SN)	22
➤ Adipose Tissue (SN)	24
3. Biochemistry of Diseases	26
➤ Diabetes Mellitus (LN/SN/Clinical Case/Viva).....	26
➤ Atherosclerosis (SN/LN)	44
➤ Fatty Liver (SN).....	46
➤ Obesity (SN/LN).....	48
4. Organ Function Tests.....	60
➤ Liver Function Tests (SN/LN)	60
➤ Kidney Function Test (SN/LN).....	66
➤ Gastric Function Tests (SN).....	74
➤ Thyroid Function Tests (SN)	77
➤ Adrenal Function Tests (SN)	86
➤ Pancreatic Function Test (SN)	92
5. Physiological Conditions.....	99
➤ Biochemistry of Aging (SN/LN)	99
➤ Biochemistry and Role of Diet in Pregnancy and Lactation (SN/LN).....	103
➤ Mens Health	116
➤ Women Health.....	124

6. Laboratory	126
➤ Total Quality Management in Clinical Laboratory (SN/LN).....	126
➤ Medical Laboratory Accreditation	144
➤ Proficiency Testing in Clinical Laboratory	147
➤ Bio Hazards in Clinical Laboratory (SN).....	152
➤ POCT (SN/Viva)	164
➤ Pre-Analytical Errors in the Laboratory.....	170
➤ Strategies to Improve Turn Around Time.....	180
➤ Choosing Right Methodology: Electrolyte and Creatinine.....	185
➤ Laboratory Information System	189
➤ NABL Accreditation.....	200
7. Miscellaneous	205
➤ Phospholipids (SN).....	205
➤ Isoenzymes (SN/LA)	209
➤ Clinical Applications of Enzymes.....	213
➤ Nitric Oxide (SN).....	216
➤ Free Radicals (SN/LN)	220
8. Nutrition	231
➤ Calorimetry (SN).....	231
➤ Basal Metabolic Rate (BMR) (SN)	232
➤ Specific Dynamic Action (SDA) (SN)	234
➤ Balanced Diet (SN).....	236
➤ Protein Energy Malnutrition (PEM) SN.....	238
➤ Diet in Management of Coronary Artery Disease (SN)	242
➤ Role of Diet in Cancer (SN).....	245
➤ Dietary Modification in Renal Disease (SN).....	249
➤ Diet in Diabetes (SN)	252
➤ Diet in Management of Hypertension (SN).....	254
➤ Diet in Management of Anaemia (SN).....	256
➤ Metabolic Response to Starvation (LA/ SN/ Viva)	257
➤ Food Additives (SN).....	260
➤ Natural Toxins of Food (SN).....	261
9. Instruments	264
➤ Colorimeter (SN/LN/Viva)	264
➤ Ultraviolet and Visible Spectrometry.....	267
➤ Turbidimetry and Nephelometry.....	270

➤ Fluorometry or Fluorescence Spectrophotometry	271
➤ Phosphorescence Spectrophotometry	273
➤ Flame Photometer (SN)	275
➤ Atomic Absorption Spectroscopy	279
➤ Ultra-centrifugation	280
➤ Electrophoresis (SN/LN/Viva).....	285
➤ Chromatography (SN/LA/Viva)	299
➤ Blood Gas Analyzer (SN/Viva).....	322
➤ Basics of Biophysical Chemistry	325
➤ Mass Spectrometry (SN/Viva)	333
➤ Nuclear Magnetic Resonance (SN).....	338
➤ Chemiluminescence (LA/ SN/ Viva).....	340
➤ Electron Microscopy (SN).....	346
➤ Ion Selective Electrodes (SN/ Viva)	349
➤ Laboratory Robots (SN).....	351
10. Genetics	353
➤ Chemistry of Nucleic Acids	353
➤ DNA Replication (LA/ SN/ Viva)	370
➤ DNA Transcription (LA/SN/Viva)	382
➤ Translation (LA/SN/Viva).....	399
➤ Prokaryotic Protein Synthesis	407
➤ Eukaryotic Protein Synthesis	409
➤ Regulation of Gene Expression (LA/Viva).....	416
➤ Repair of DNA Damages and Diseases (LA/SN/Viva).....	425
➤ Polymerase Chain Reaction [PCR] (SN/LA/Viva)	435
➤ DNA Fingerprinting (SN)	439
➤ DNA Libraries (SN).....	441
➤ Recombinant DNA Technology (SN)	447
➤ Blotting Techniques (SN).....	451
➤ Gene Therapy (SN)	456
➤ Stem Cell Therapy (SN).....	468
➤ Mitochondrial DNA and Diseases (SN).....	475
➤ Human Genome Project (HGP) (SN).....	476
➤ Genome Mapping (SN).....	478
➤ Clinical Bioinformatics (SN)	481
➤ Nanotechnology (SN).....	484

> Molecular Basis of Cancer (LA/SN).....	486
> Proteomics (SN).....	495
11. Recent Trends	498
> Establishing Biomarker Panels in Lab: Forging Towards Tailor-Made Therapies.....	498
> Biochemical Insights to Metabolic Dysfunction	502
12. Analytes	513
> Blood Gas Analysis	513
> Procalcitonin.....	518
> Conversion Factor	519
13. Practicals	521
> Estimation of Total Protein, Albumin, A/G Ratio	521
> Estimation of Blood Glucose	525
> Estimation of Serum Amylase by Amylolytic Method	529
> Plasma and Urine Creatinine Estimation and Creatinine Clearance Test	530
> Colour Reactions of Proteins	535
> Tests on Disaccharides	538
> Test of Polysaccharides	540
> Estimation of Blood Glucose by Glucose Oxidase Peroxidase Method.....	543
> Osazone.....	545
> Estimation of SGOT-Serum Glutamate Oxaloacetate Transaminase (Serum Aspartate Transaminases).....	548
> Estimation of Serum Bilirubin	550
> Hyperbilirubinemia and Jaundice	555
> Estimation of Serum Cholesterol by Enzymatic Method.....	557
> Estimation of Serum Alkaline Phosphatase Activity	558
> Method of Bodansky.....	562
> Estimation of SGPT-Serum Glutamate Pyruvate Transaminase (Serum Alanine Transaminases) Reitman And Frankal Method.....	574
> Estimation of Serum Inorganic Phosphorus by Fiske Subbarow Method	576
> Effect of Substrate Concentration on Alkaline Phosphatase Activity	578
> Estimation of 17 – Ketosteroids.....	581
> Glycosylated Haemoglobin.....	582
> Haemoglobin Electrophoresis	582
> Paper Chromatography	583
> Protein Electrophoresis	584
> Thin Layer Chromatography.....	586

➤ Plasma Proteins	586
➤ Ethical Guidelines for Biomedical Research on Human Participants (SN).....	603
14. Thesis Writing	603
15. Model Question Papers	612
➤ <i>Paper 1</i>	612
➤ <i>Paper 2</i>	619
➤ <i>Paper 3</i>	627
➤ <i>Paper 4</i>	635