Contents

1. **Glucose Homeostasis: Abnormalities and Assessment 1**
   Normal glucose level; Oral glucose tolerance test; Diagnostic criteria of diabetes mellitus; Reducing substances in urine; Insulin; Metabolic derangements in diabetes; Ketosis; Complications of diabetes mellitus; Laboratory investigations; Glycated hemoglobin.

2. **Plasma Lipids, Lipoproteins, Cholesterol and Cardiovascular Diseases 33**
   Classification of lipoproteins; Chylomicrons; Very low density lipoproteins; Low density lipoproteins; High density lipoproteins; Hypolipoproteinemias; Hyperlipidemias; Serum cholesterol; Risk factors of atherosclerosis; Prevention of atherosclerosis.

3. **Plasma Proteins 61**
   Electrophoresis; Albumin; Transport proteins; Acute phase proteins; C-reactive protein; Ceruloplasmin; Clotting factors; Hemophilia; Immunoglobulins; Multiple myeloma; Bence Jones proteinuria; Complement system; Autoimmunity.

4. **Clinical Enzymology 97**
   Creatine kinase; Cardiac troponins; Lactate dehydrogenase; Brain natriuretic peptide; Aspartate amino transferase; Alanine amino transferase; Alkaline phosphatase; Nucleotide phosphatase; Gamma

glutamyl transferase; Acid phosphatase; Prostate specific antigen; Glucose-6-phosphate dehydrogenase; Amylase; Lipase; Enolase.

5. **Mineral Metabolism and Abnormalities 109**
Calcium; Vitamin D and Calcitriol; Parathyroid Hormone; Calcitonin; Hypercalcemia; Hypocalcemia; Phosphorus; Magnesium; Iron; Absorption and transport; Iron deficiency anemia; Iron toxicity; Copper; Zinc; Iodine; Selenium.

6. **Liver Function Tests 153**
Functions of liver; Albumin; Alpha fetoprotein; Transthyretin; Alpha-1-antitrypsin; Haptoglobin; Lipoprotein X; Bilirubin; Types of jaundice; Aminopyrine excretion test; AST, ALT, Alkaline phosphatase; Ammonia; Immunological tests; Cirrhosis; Porphyrias.

7. **Renal Function Tests 195**
Glomerular function; Functions of tubules; Screening for kidney disease; Clearance tests; Creatinine clearance test; Cystatin C; Urea clearance test; Proteinurias; Micro-albuminuria; Tests for tubular function; Specific gravity; Osmolality; Dilution; Acidification; Fractional excretion of sodium and phosphate; Renal transplantation; Cryoglobulinemia.

8. **Acid-Base Disorders 231**
Acidity and pH; Buffers; Bicarbonate buffer system; Respiratory regulation of pH; Renal regulation of pH; Metabolic acidosis; Anion gap; Lactic acidosis; Compensated metabolic acidosis; Metabolic alkalosis; Respiratory acidosis; Respiratory alkalosis; Assessment.

9. **Electrolyte and Water Balance** 267
Sodium; Edema; Laboratory evaluation; Osmolality; Antidiuretic hormone; Isotonic contraction; Hypotonic contraction; Hypertonic contraction; Isotonic expansion; Hyperosmolality; Potassium; Hypokalemia; Hyperkalemia; Chloride.

10. **Inherited Metabolic Disorders and Prenatal Diagnosis** 303
Genetic counseling; Amniocentesis; Cytogenetics; Alpha fetoprotein; Human chorionic gonadotrophin; Unconjugate estriol; Dimeric Inhibin A; Screening during first trimester; Newborn screening; Investigations for metabolic disorders.

11. **Molecular Diagnostics** 327
Hemoglobinopathies; Cystic fibrosis; Multiple endocrine neoplasia; Neurofibromatosis; Huntington's disease; Duchenne muscular dystrophy; Spinal muscular atrophy; Fragile X syndrome; Congenital hypothyroidism; Viral diseases; Bacterial diseases.

12. **Endocrine Disorders** 341
Growth hormone; Prolactin; Adrenocorticotropin; Follicular stimulating hormone; Luteinizing hormone; Thyroid stimulating hormone; Vasopressin; Antidiuretic hormone; Thyroxine; Tri-iodothyronine; Evaluation of hypothyroidism; Evaluation of hyperthyroidism; Cortisol; Renin angiotensin aldosterone system; Congenital adrenal hyperplasia; Catecholamines; Serotonin; Gastrin; Vasoactive intestinal polypeptide; Pancreatic polypeptide; Testosterone; Estradiol; Progesterone; Parathyroid hormone.

Appendices **427**
Appendix I : Reference Values **428**

Appendix II : Interpretation of Laboratory Results **438**
Establishment of reference values; Reference values and observed values; Pre-analytical variables; Preservation of specimens; Variables; Quality control; Accuracy; Precision; Specificity; Sensitivity; Total quality management; Reference material; Control charts; External quality assurance.

Appendix III: Overview of Techniques in Clinical Chemistry **456**
Electrophoresis; Adsorption chromatography; Partition chromatography; Thin layer chromatography; Ion exchange chromatography; Gel filtration chromatography; Affinity chromatography; High performance liquid chromatography HPLC); Mass spectrometry; Potentiometry; Ion selective electrodes; Voltammetry; Amperometry; Conductometry; Optical chemical sensors; Biosensors; Immunoblotting; Radio immuno assay (RIA); Enzyme linked immuno sorbentassay (ELISA) Colorimeter; Spectrophotometer; Luminiscence

Appendix IV: Molecular Biology Techniques **481**
Polymerase chain reaction (PCR); Reverse transcriptase PCR, Quantitative real time PCR, Multiplex PCR; Single strand conformation polymorphism (SSCP); Hetero-duplex analysis; Conformaton sensitive gel electro-phoresis (CSGE); Protein truncation test (PTT);

Denaturing high performance liquid chromatography (DHPLC); DNA sequencing; Southern blotting; In situ hybridization (ISH); Fluorescent in situ hybridization (FISH).

Index *493*