

Contents

Foreword by Dr B Viswanatha Rao
Preface

vii
ix

1. General Physiology	1
1.1 Cell Structure and Functions	1
1.2 Body Fluid Compartments	4
1.3 Homeostasis	6
1.4 Transport Across Cell Membrane	8
1.5 Bioelectric Potentials	10
2. Blood	13
2.1 Blood – An Overview	13
2.2 Red Blood Corpuscles	15
2.3 White Blood Corpuscles	18
2.4 Platelets and Hemostasis	26
2.5 Blood Grouping and Transfusion Reactions	30
3. Muscle Physiology	33
3.1 Skeletal Muscle	33
3.2 Properties of Skeletal Muscle	38
3.3 Neuromuscular Junction	41
3.4 Smooth Muscle	43
4. Gastrointestinal System	45
4.1 Introduction to Gastrointestinal System	45
4.2 Salivary Secretion and Deglutition	47
4.3 Gastric Secretion	50
4.4 Pancreatic Secretion	54
4.5 Hepatobiliary and Intestinal Secretion	56
4.6 Motility of the Gut	59
4.7 Gastrointestinal Hormones	62
5. Excretory System	64
5.1 Introduction to Excretory System	64
5.2 Glomerular Filtration	69
5.3 Tubular Reabsorption	71
5.4 Countercurrent System and Concentration of Urine	75
5.5 Acid Base Balance	77
5.6 Micturition	80
6. Endocrine System	82
6.1 Endocrine System – An Overview	82
6.2 Posterior Pituitary Hormones	85
6.3 Anterior Pituitary Hormones	88
6.4 Thyroid Hormones	90
6.5 Parathyroid Hormones	94
6.6 Pancreatic Hormones	97
6.7 Adrenal Cortical Hormones	100
6.8 Adrenal Medullary Hormones	103

7. Reproductive System	105
7.1 Reproductive System – An Overview	105
7.2 Male Reproductive System	107
7.3 Menstrual Cycle	110
7.4 Pregnancy, Parturition and Lactation	114
7.5 Contraception	119
8. Cardiovascular System	119
8.1 Introduction to Cardiovascular System	119
8.2 Cardiac Output	123
8.3 Cardiac Cycle	127
8.4 Heart Rate	132
8.5 ECG	134
8.6 Hemodynamics	137
8.7 Blood Pressure	140
8.8 Shock	145
8.9 Regional Circulation	148
9. Respiratory System	150
9.1 Introduction to Respiratory System	150
9.2 Mechanics of Breathing	153
9.3 Compliance, Surfactant and Ventilation Perfusion Ratio	156
9.4 Diffusion and Transport of Gases	159
9.5 Regulation of Respiration	164
9.6 Hypoxia and High Altitude Physiology	167
9.7 Deep Sea Physiology	171
9.8 Asphyxia and Artificial Respiration	173
9.9 Pulmonary Function Tests	176
10. Nervous System	179
10.1 Introduction to Nervous System	179
10.2 Nerves and Nerve Injury	182
10.3 Ascending and Descending Tracts	185
10.4 Spinal Cord	190
10.5 Receptors	193
10.6 Synapse	197
10.7 Muscle Tone	201
10.8 Reflexes	203
10.9 Cerebellum	206
10.10 Basal Ganglia	210
10.11 Thalamus	212
10.12 Hypothalamus	214
10.13 Sleep and EEG	217
10.14 Cerebral Cortex	219
10.15 Learning, Memory and Limbic System	222
10.16 Pain and Analgesic System	224
10.17 Cerebrospinal Fluid	226
10.18 Autonomic Nervous System	229
11. Special Senses	232
11.1 Vision	232
11.2 Hearing	239
11.3 Taste and Smell	243