

Contents

<i>Preface to the Third Edition</i>	v
<i>Preface to the First Edition</i>	vii
<i>Acknowledgments</i>	ix
<i>Special Features of the Book</i>	xi
<i>Syllabus</i>	xiii

Chapter 1	Introduction to Anatomical Terms and Organization of the Human Body	1–28
------------------	--	-------------

Introduction	2
Anatomy	2
Physiology	22

Chapter 2	Introduction to the Detailed Structure of Cells and Tissues of the Body	29–52
------------------	--	--------------

Introduction	30
Levels of Organization	30
Cell Structure and Functions	31
Cell Division	34
Cell Extensions	36
Glands	36
Membranes	36
Cell Death	39
Tissues	39

Chapter 3	Blood	53–74
------------------	--------------	--------------

Introduction	54
Composition of Blood	54
Functions of Blood	62
Formation of Blood (Hematopoiesis)	63
Blood Products and their Uses	64
Blood Groups	64
Blood Clotting (Hemostasis)	66
Blood Indices	68
Differential White Blood Cell Count	69

Chapter 4	Circulatory System	75–104
	Introduction	76
	Anatomy	
	Circulation of Blood	76
	Heart	78
	Blood Vessels.....	84
	Major Arterial Supply	84
	Blood Supply of Head and Neck	86
	Venous Return from the Head and Neck	87
	Arterial Supply of Upper Limb	89
	Venous Drainage of the Upper Limb.....	90
	Circulation of Blood in Abdomen and Pelvis	93
	Blood Supply of the Lower Limb	93
	Hepatic Portal Circulation	94
	Physiology	
	Conducting System of Heart.....	96
	Cardiac Cycle	96
	Electrocardiography.....	98
	Cardiac Output.....	98
	Pulse.....	98
	Blood Pressure.....	99
Chapter 5	Lymphatic System	105–115
	Introduction	106
	Lymphatic Organs.....	106
	Lymphatic Vessels	109
	Lymphatic Flow.....	110
	Composition of Lymph.....	111
	Functions of Lymphatic System	112
	Physiology.....	112
Chapter 6	Respiratory System	117–135
	Introduction	118
	Organs of Respiration	118
	Physiology.....	127
	Gas Exchange in Lungs.....	132
	Transport of Gases in Bloodstream.....	132
	Basal Metabolic Rate	132

Chapter 7	Digestive System	137–167
	Introduction	138
	Functions of Gastrointestinal System	138
	Layers of the Alimentary Canal	139
	Subdivisions of the Abdominal Cavity	140
	Components of Alimentary Canal	141
	Glands Associated with Digestive System	157
	Extrahepatic Biliary Apparatus	159
	Spleen.....	161
	Physiology	
	Digestion and Absorption of Food	161
Chapter 8	Nutrition	169–194
	Introduction	170
	Nutrition and Health	170
	Balanced Diet	170
	Nutritional Needs During Various Stages of Life.....	172
	Basal Metabolic Rate	175
	Proteins	175
	Fats: The Concentrated Energy Source	177
	Carbohydrates	178
	Minerals and Trace Elements.....	179
	Vitamins	180
	Water: The Most Important Nutrient.....	187
	Methods of Nutritional Assessment	187
	Therapeutic Diets for Specific Ailments	187
	Physiology	
	Metabolism.....	189
	Purposes of Absorbed Food Molecules.....	190
Chapter 9	Excretory System—Urinary System	195–212
	Introduction	196
	Urinary System	196
	Physiology	
	Mechanism of Urine Formation	202
	Fluid and Electrolyte Balance.....	206
	Micturition	207
	Blood Pressure Regulation-Role of Juxtaglomerular Apparatus.....	208

Chapter 10	Endocrine System	213–231
	Introduction	214
	Major Endocrine Glands	214
	Control of Hormone Secretion—Feedback Loops	214
	Hypothalamus	216
	Pituitary Gland (Hypophysis Cerebri)	216
	Thyroid Gland	220
	Parathyroid Glands	222
	Suprarenal/Adrenal Glands	222
	Pancreas (Islets of Langerhans)	225
	Pineal gland	226
	Ovaries	226
	Testes	227
	Placenta	227
	Juxtaglomerular Apparatus in Kidneys	227
	Local Hormones	228
Chapter 11	Reproductive System	233–259
	Introduction	234
	Female Reproductive System	234
	Physiology Related to Female Reproductive System	
	Function of Female Reproductive Hormones	244
	Menstrual Cycle	244
	Breast or Mammary Gland	245
	Physiology of Lactation	248
	Male Reproductive System	248
	Physiology Related to Male Reproductive System	
	Spermatogenesis and Spermiogenesis	251
	Fundamentals of Reproduction	
	Puberty	252
	Human Sexual Response	253
	Fertilization	253
	Reproductive Health	256
Chapter 12	Sense Organs—The Special Senses	261–285
	Introduction	262
	The Tongue—Sense of Taste	262
	The Nose—Sense of Smell	263
	The Eye—Sense of Vision	264

The Ear—Sense of Hearing	269
The Skin—Sense of Touch	275
Physiology	
Regulation of Body Temperature	278

Chapter 13 **Nervous System** **287–312**

Introduction	288
Neurons	288
Physiology: The Nerve Impulse	290
Central Nervous System	292
Peripheral Nervous System and the Cranial Nerves	302
Autonomic Nervous System	304

Chapter 14 **Skeletal System (Osteology)** **313–338**

Introduction	314
Composition and Growth of Bone	314
Functions and Classification of Bone	314
Structure of Bone	315
Ossification (Bone Formation)	316
Bone Healing and Remodeling	317
Tendons and Ligaments	317
Bones of the Axial Skeleton	317
Bones of Appendicular Skeleton	324
Joints	329

Chapter 15 **Muscular System** **339–366**

Introduction	340
Characteristics of Muscular System	340
Composition of Muscle Fibers	340
Striated and Nonstriated Muscle Tissues	340
Classification of Muscular Tissue	342
Microscopic Structure of Skeletal Muscle	344
Smooth Muscles	348
Cardiac Muscles	348
Physiology	349
Fascia	350
Skeletal Muscles In Human Body	351
Anatomical Spaces	362

Appendices	367–397
Appendix 1: <i>Anatomical Terms Used in Clinical Settings</i>	367
Appendix 2: <i>Essential Systems and Processes in Human Body</i>	369
Appendix 3: <i>Smallest and Largest Components in Human Body</i>	370
Appendix 4: <i>Histological Slides</i>	371
Appendix 5: <i>Anatomical Pearls</i>	385
Appendix 6: <i>Physiological Pearls</i>	386
Appendix 7: <i>Measurements</i>	387
Appendix 8: <i>Normal Values for Selected Blood Tests</i>	388
Appendix 9: <i>Normal Values</i>	390
Appendix 10: <i>Tips to Memorize</i>	392
Appendix 11: <i>Dissection Images</i>	394
 First Year GNM Examination Papers	
<i>Bioscience (Anatomy, Physiology and Microbiology)</i>	399–405
 <i>Index</i>	407