Anatomy and physiology objectives assignment

Anatomy and Physiology Chapter Objectives

Chapter 1: Introduction to the Human Body Chapter 2: The Chemical Level of Organization Chapter 3: The Cellular Level of Organization Chapter 4: The Tissue Level of Organization Chapter 5: The Integumentary System Chapter 6: The Skeletal System – Bone Tissue Chapter 7: The Skeletal System – The Axial Skeleton Chapter 8: The Skeletal System – The Appendicular Skeleton Chapter 9: Joints Chapter 10: Muscular Tissue Chapter 11: The Muscular System Chapter 12: Nervous Tissue Chapter 13: The Spinal Cord and Spinal Nerves Chapter 14: The Brain and Cranial Nerves Chapter 15: The Autonomic Nervous System Chapter 16: Sensory, Motor, and Integrative System Chapter 17: The Special Senses Chapter 18: The Endocrine System Chapter 19: The Cardiovascular System – The Blood Chapter 20: The Cardiovascular System – The Heart Chapter 21: The Cardiovascular System – Blood Vessels and Hemodynamics Chapter 22: The Lymphatic System and Immunity Chapter 23: The Respiratory System Chapter 24: The Respiratory System Chapter 25: Metabolism and Nutrition Chapter 26: The Urinary System Chapter 27: Fluid, Electrolyte, and Acid-Base Homeostasis Chapter 28: The Reproductive System Chapter 29: Development and Inheritance 2 2 2 3 3 3 4 4 4 5 5 6 6 7 7 8 8 8 9 9 10 11 11 12 12 13 13 14 14 Chapter 1: Introduction to the Human Body ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Define anatomy and physiology, and name several subspecialties of these sciences. Describe the levels of structural organization that make up the human body. List the 11 systems of the human body, representative organs present in each, and their general functions. Define the important life processes of the human body. Define homeostasis and explain its relationship to interstitial fluid. Define

homeostasis. Describe the components of a feedback system. Contrast the operation of negative and positive feedback systems. Explain how homeostatic imbalances are related to disorders. Describe the anatomical position. Relate the common names to the corresponding anatomical descriptive terms for various regions of the human body.

Define the anatomical planes, sections, and directional terms used to describe the human body. Outline the major body cavities, the organs they contain, and their associated linings. Chapter 2: The Chemical Level of Organization ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Identify the main chemical elements of the human body. Describe the structures of atoms, ions, molecules, free radicals, and compounds. De? ne a chemical reaction. Describe the various forms of energy. Compare exergonic and endergonic chemical reactions. Describe the role of activation energy and catalysts in chemical reactions. Describe synthesis, decomposition, exchange, and reversible reactions. Describe the properties of water and those of inorganic acids, bases, and salts.

Distinguish among solutions, colloids, and suspensions. De? ne pH and explain the role of buffer systems in homeostasis. Describe the functional groups of organic molecules. Identify the building blocks and functions of carbohydrates, lipids, and proteins. Describe the structure and functions of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and adenosine triphosphate (ATP). Chapter 3: The Cellular Level of Organization ??? ??? ??? ??? Describe the structure and functions of the plasma membrane. Explain the concept of selective permeability. De? ne the electrochemical gradient and describe its components. Describe the

processes that transport substances across the plasma membrane. ??? ??? ??? ??? ??? ???

Describe the structure and function of cytoplasm, cytosol, and organelles. Describe the structure and function of the nucleus. Describe the sequence of events in protein synthesis. Discuss the stages, events, and signi? cance of somatic and reproductive cell division. Describe the signals that induce somatic cell division. Describe how cells differ in size and shape. Chapter 4: The Tissue Level of
Organization ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Name the four basic types of tissues that make up the human body and state the characteristics of each. Describe the structure and functions of the ? ve main types of cell junctions. Describe the general features of epithelial tissue.

List the location, structure, and function of each different type of epithelium. Describe the general features of connective tissue. Describe the structure, location, and function of the various types of connective tissue. De? ne a membrane. Describe the classi? cation of membranes. Describe the general features of muscular tissue. Contrast the structure, location, and mode of control of skeletal, cardiac, and smooth muscle tissue. Describe the structural features and functions of nervous tissue. Explain the concept of electrical excitability. Describe the role of tissue repair in restoring homeostasis. Describe the effects of aging on tissues.

Chapter 5: The Integumentary System ??? ??? ??? ??? ??? ??? ??? ???
Describe the layers of the epidermis and the cells that compose them. Compare the composition of the papillary and reticular regions of the dermis.

Explain the basis for different skin colors. Contrast the structure, distribution, and functions of hair, skin glands, and nails. Compare structural and functional differences in thin and thick skin. Compare structural and functional differences in thin and thick skin. Describe the effects of aging on the integumentary system. Contrast the structure, distribution, and functions of hair, skin glands, and nails. Chapter 6: The Skeletal System – Bone Tissue ??? ??? ??? Describe the six main functions of the skeletal system. Describe the structure and functions of each part of a long bone. Describe the histological features of bone tissue. Describe the blood and nerve supply of bone. ??? ??? ??? ??? ??? ??? Describe the steps of intramembranous and endochondral ossi? cation. Explain how bone grows in length and thickness. Describe the process involved in bone remodeling. Describe the sequence of events involved in fracture repair. Describe the importance of calcium in the body. Explain how blood calcium level is regulated. Chapter 7: The Skeletal System – The Axial Skeleton ??? ??? ??? ??? ??? ??? ??? ??? Describe how the skeleton is divided into axial and appendicular divisions.

Classify bones based on their shape or location. Describe the principal surface markings on bones and the functions of each. Name the cranial and facial bones and indicate whether they are paired or single. Describe the following special features of the skull: sutures, paranasal sinuses, and fontanels. Describe the relationship of the hyoid bone to the skull. Identify the regions and normal curves of the vertebral column and describe its structural and functional features. Identify the bones of the thorax. Chapter 8: The Skeletal System – The Appendicular

Skeleton ??? ??? ??? ??? ??? ??? ??? ??? ??? Identify the bones of the pectoral (shoulder) girdle and their principal markings.

Identify the bones of the upper limb and their principal markings. Describe the joints between the upper limb bones. Identify the bones of the pelvic girdle and their principal markings. Describe the division of the pelvic girdle into false and true pelves. Compare the principal differences between female and male pelves. Identify the bones of the lower limb and their principal markings. Describe the development of the skeletal system. Compare the principal differences between female and male pelves. Chapter 9:
Joints ??? ??? ??? ??? ??? ??? ??? ??? Describe the structural and functional classi? cations of joints. Describe the structure and functions of the three types of ? brous joints.

Describe the structure and functions of the two types of cartilaginous joints. Describe the structure of synovial joints. Describe the structure and function of bursae and tendon sheaths. Describe the types of movements that can occur at synovial joints. Describe the six subtypes of synovial joints. Describe six factors that in? uence the type of movement and range of motion possible at a synovial joint. Explain the effects of aging on joints. ??? Explain the procedures involved in arthroplasty, and describe how a total hip replacement is performed. Chapter 10: Muscular
Tissue ??? Explain the structural differences between the three types of muscular tissue.

Compare the functions and special properties of the three types of muscular tissue. Explain the importance of connective tissue components, blood vessels, and nerves to skeletal muscles. Describe the microscopic anatomy of a skeletal muscle ? ber. Distinguish thick ? laments from thin ? laments. Outline the steps involved in the sliding ? lament mechanism of muscle contraction. Describe how muscle action potentials arise at the neuromuscular junction. Describe the reactions by which muscle ? bers produce ATP. Distinguish between anaerobic and aerobic cellular respiration. Describe the factors that contribute to muscle fatigue. Describe the structure and function of a motor unit, and de? ne motor unit recruitment.

Explain the phases of a twitch contraction. Describe how frequency of stimulation affects muscle tension, and how muscle tone is produced. Distinguish between isotonic and isometric contractions. Compare the structure and function of the three types of skeletal muscle ? bers. Describe the effects of exercise on different types of skeletal muscle ? bers. Describe the main structural and functional characteristics of cardiac muscle tissue. Describe the main structural and functional characteristics of smooth muscle tissue. Explain how muscle ? bers regenerate. Describe the development of muscles. Explain the effects of aging on skeletal muscle. Chapter 11: The Muscular System ??? ??? ??? ??? ??? ??? ??? Describe the relationship between bones and skeletal muscles in producing body movements. De? ne lever and fulcrum, and compare the three types of levers based on location of the fulcrum, effort, and load. Identify the types of fascicle arrangements in a skeletal muscle, and relate the arrangements to strength of contraction and range of motion. Explain how the prime mover, antagonist, synergist,

and ? xator in a muscle group work together to produce movements. Explain seven features used in naming skeletal muscles. Describe the origin, insertion, action, and innervation of the muscles that move the humerus. Describe the origin, insertion, action, and innervation of the intrinsic muscles of the hand.

Describe the origin, insertion, action, and innervation of the muscles that move the femur. ??? ??? Describe the origin, insertion, action, and innervation of the muscles that act on the femur, tibia, and ? bula. Describe the origin, insertion, action, and innervation of the muscles that move the foot and toes. Chapter 12: Nervous
Tissue ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? List the structures of the nervous system. Describe the three basic functions of the nervous system. Contrast the histological characteristics and the functions of neurons and neuroglia. Distinguish between gray matter and white matter. Describe the organization of the nervous system. Recall that the nervous system consists of two main subdivisions: the central nervous system and the peripheral nervous system) Describe the cellular properties that permit communication among neurons and effectors. Compare the basic types of ion channels, and explain how they relate to graded potentials and action potentials. Describe the factors that maintain a resting membrane potential. List the sequence of events that generate an action potential. Explain the events of signal transmission at a chemical synapse. Distinguish between spatial and temporal summation. Give examples of excitatory and inhibitory neurotransmitters, and describe how they act. Describe the classes and functions of neurotransmitters.

Identify the various types of neural circuits in the nervous system. Describe the classes and functions of neurotransmitters. Identify the various types of neural circuits in the nervous system. Chapter 13: The Spinal Cord and Spinal Nerves ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Describe the protective structures and the gross anatomical features of the spinal cord. Describe how spinal nerves are connected to the spinal cord. Describe the components, connective tissue coverings, and branching of a spinal nerve. De? ne plexus, and identify the distribution of nerves of the cervical, brachial, lumbar, and sacral plexuses. Describe the clinical signi? cance of dermatomes.

Describe the functions of the major sensory and motor tracts of the spinal cord. Describe the functional components of a re? ex arc and the ways re? exes maintain homeostasis. Describe the protective structures and the gross anatomical features of the spinal cord. Describe how spinal nerves are connected to the spinal cord. Describe the origin and distribution of the cervical plexus. Describe the origin, distribution, and effects of damage to the brachial plexus. Describe the origin and distribution of the lumbar plexus. Describe the origin and distribution of the sacral and coccygeal plexuses. Chapter 14: The Brain and Cranial
Nerves ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ?? ??? ??? Identify the major parts of the brain.

Describe how the brain is protected. Describe the blood supply of the brain. Explain the formation and circulation of cerebrospinal ? uid. Describe the structures and functions of the brain stem Describe the structure and functions of the cerebellum. Describe the components and functions of the

diencephalon. Describe the cortex, gyri, ? ssures, and sulci of the cerebrum. List and locate the lobes of the cerebrum. Describe the nuclei that comprise the basal ganglia. List the structures and describe the functions of the limbic system. Describe the locations and functions of the sensory, association, and motor areas of the cerebral cortex. Explain the signi? ance of hemispheric lateralization. De? ne brain waves and indicate their signi? cance. Identify the cranial nerves by name, number, and type, and give the functions of each. Describe how the parts of the brain develop. Describe the effects of aging on the nervous system. Explain the formation and circulation of cerebrospinal ? uid. Describe the components and functions of the diencephalon. Describe the locations and functions of the sensory, association, and motor areas of the cerebral cortex. Explain the signi? cance of hemispheric lateralization. ??? De? ne brain waves and indicate their signi? cance. Chapter 15: The Autonomic Nervous System ??? ??? ??? ??? ??? ??? Compare the structural and functional differences between the somatic and autonomic parts of the nervous system. Describe preganglionic and postganglionic neurons of the autonomic nervous system. Compare the anatomical components of the sympathetic and parasympathetic divisions of the autonomic nervous system. Describe the neurotransmitters and receptors involved in autonomic responses. Describe the major responses of the body to stimulation by the sympathetic and parasympathetic divisions of the ANS. Describe the components of an autonomic re? ex. Explain the relationship of the hypothalamus to the ANS. Chapter 16: Sensory, Motor, and Integrative System ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? De? ne sensation, and discuss the components of sensation. Describe the different ways to classify

sensory receptors. Describe the location and function of the somatic sensory receptors for tactile, thermal, and pain sensations. Identify the receptors for proprioception and describe their functions. Describe the neuronal components and functions of the posterior column??? medial lemniscus pathway, the anterolateral pathway, and the spinocerebellar pathway. Identify the locations and functions of the different types of neurons in the somatic motor pathways. Compare the locations and functions of the direct and in- direct motor pathways.

Explain how the basal ganglia and cerebellum contribute to movements. Compare the integrative cerebral functions of wakefulness and sleep, and learning and memory. Describe the four stages of sleep. Explain the factors that contribute to memory. Identify the locations and functions of the different types of neurons in the somatic motor pathways. Compare the locations and functions of the direct and indirect motor pathways. Explain how the basal ganglia and cerebellum contribute to movements. Chapter 17: The Special Senses ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Describe the olfactory receptors and the neural pathway for olfaction. Describe the gustatory receptors and the neural pathway for gustation.

List and describe the accessory structures of the eye and the structural components of the eyeball. Discuss image formation by describing refraction, accommodation, and constriction of the pupil. Describe the processing of visual signals in the retina and the neural pathway for vision. Describe the anatomy of the structures in the three main regions of the ear. List the major events in the physiology of hearing. Identify the receptor organs for equilibrium, and describe how they function. Describe the

auditory and equilibrium pathways. Describe the development of the eyes and the ears. Describe the age related changes that occur in the eyes and ears. Chapter 18: The Endocrine System ??? ??? ??? ??? Compare control of body functions by the nervous system and endocrine system. Distinguish between exocrine and endocrine glands. Describe how hormones interact with target-cell receptors. Compare the two chemical classes of hormones based on their solubility. Describe the two general mechanisms of hormone action. ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Describe the mechanisms of control of hormone secretion. Describe the locations of and relationships between the hypothalamus and pituitary gland. Describe the location, histology, hormones, and functions of the anterior and posterior pituitary. Describe the location, histology, hormones, and functions of the thyroid gland.

Describe the location, histology, hormone, and functions of the parathyroid glands. Describe the location, histology, hormones, and functions of the adrenal glands. Describe the location, histology, hormones, and functions of the pancreatic islets. Describe the location, hormones, and functions of the male and female gonads. Describe the location, histology, hormone, and functions of the pineal gland. List the hormones secreted by cells in tissues and organs other than endocrine glands, and describe their functions. Describe the actions of eicosanoids and growth factors. Describe how the body responds to stress. Describe the development of endocrine glands.

Describe the effects of aging on the endocrine system. Describe the two general mechanisms of hormone action. Describe how the body responds to stress. Chapter 19: The Cardiovascular System – The

Blood ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Describe the functions of blood. Describe the physical characteristics and principal components of blood. Explain the origin of blood cells. Describe the structure, functions, life cycle, and production of red blood cells. Describe the structure, functions, and production of white blood cells (WBCs). Describe the structure, function, and origin of platelets. Explain the importance of bone marrow transplants and stem cell transplants.

Describe the three mechanisms that contribute to hemostasis. Identify the stages of blood clotting and explain the various factors that promote and inhibit blood clotting. Distinguish between the ABO and Rh blood groups. Explain why it is so important to match donor and recipient blood types before administering a transfusion. Chapter 20: The Cardiovascular System – The Heart ??? ??? ??? Describe the location of the heart. Describe the structure of the pericardium and the heart wall. Discuss the external and internal anatomy of the chambers of the heart. ??? Describe the structure and function of the valves of the heart. Outline the ? w of blood through the chambers of the heart and through the systemic and pulmonary circulations. Discuss the coronary circulation. Describe the structural and functional characteristics of cardiac muscle tissue and the conduction system of the heart. Explain how an action potential occurs in cardiac contractile ? bers. Describe the electrical events of a normal electrocardiogram (ECG). Describe the pressure and volume changes that occur during a cardiac cycle. Relate the timing of heart sounds to the ECG waves and pressure changes during systole and

diastole. Explain the relationship between exercise and the heart. Describe several techniques used for failing hearts.

Describe the development of the heart. Describe the structural and functional characteristics of cardiac muscle tissue and the conduction system of the heart. Explain how an action potential occurs in cardiac contractile ? bers. Describe the electrical events of a normal electrocardiogram (ECG). De? ne cardiac output. Describe the factors that affect regulation of stroke volume. Outline the factors that affect the regulation of heart rate. Chapter 21: The Cardiovascular System – Blood Vessels and Hemodynamics ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Contrast the structure and function of arteries, arterioles, capillaries, venules, and veins. Outline the vessels through hich the blood moves in its passage from the heart to the capillaries and back. Distinguish between pressure reservoirs and blood reservoirs. Discuss the pressures that cause movement of ? uids between capillaries and interstitial spaces. Explain the factors that regulate the volume of blood ? ow. Explain how blood pressure changes throughout the cardiovascular system. Describe the factors that determine mean arterial pressure and systemic vascular resistance. Describe the relationship between cross-sectional area and velocity of blood ? ow. Describe how blood pressure is regulated. De? ne pulse, and de? ne systolic, diastolic, and pulse pressures. De? e shock, and describe the four types of shock. Explain how the body’s response to shock is regulated by negative feedback. Describe and compare the major routes that blood takes through various regions of the body. Describe the development of blood vessels and blood. Explain the effects of aging on the cardiovascular

system. ??? ??? ??? ??? ??? ??? ??? Contrast the structure and function of arteries, arterioles, capillaries, venules, and veins. Outline the vessels through which the blood moves in its passage from the heart to the capillaries and back. Distinguish between pressure reservoirs and blood reservoirs. Explain the factors that regulate the volume of blood ? ow.

Explain how blood pressure changes throughout the cardiovascular system. Describe the factors that determine mean arterial pressure and systemic vascular resistance. Describe the relationship between cross-sectional area and velocity of blood ? ow. Chapter 22: The Lymphatic System and Immunity ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? List the components and major functions of the lymphatic system. Describe the organization of lymphatic vessels. Explain the formation and ? ow of lymph. Compare the structure and functions of the primary and secondary lymphatic organs and tissues. Describe the development of lymphatic tissues. Describe the components of innate immunity. De? e adaptive immunity, and describe how T cells and B cells arise. Explain the relationship between an antigen and an antibody. Compare the functions of cell-mediated immunity and antibody-mediated immunity. Outline the steps in a cell-mediated immune response. Distinguish between the action of natural killer cells and cytotoxic T cells. De? ne immunological surveillance. Describe the steps in an antibody-mediated immune response. List the chemical characteristics and actions of antibodies. Explain how the complement system operates. Distinguish between a primary response and a secondary response to infection. Chapter 23: The Respiratory
System ??? ??? ??? ??? ??? ??? ??? ??? ??? Describe the anatomy and

histology of the nose, pharynx, larynx, trachea, bronchi, and lungs. Identify the functions of each respiratory system structure. Describe the events that cause inhalation and exhalation. Explain the difference between tidal volume, inspiratory reserve volume, expiratory reserve volume, and residual volume. Differentiate between inspiratory capacity, functional residual capacity, vital capacity, and total lung capacity. Explain Dalton’s law and Henry’s law. Describe the exchange of oxygen and carbon dioxide in external and internal respiration. Describe how the blood transports oxygen and carbon dioxide.

Explain how the nervous system controls breathing. List the factors that can alter the rate and depth of breathing ??? ??? ??? ??? ??? ??? ??? Describe the effects of exercise on the respiratory system. Describe the development of the respiratory system. Describe the effects of aging on the respiratory system. Describe the anatomy and histology of the nose, pharynx, larynx, trachea, bronchi, and lungs. Identify the functions of each respiratory system structure. Explain the difference between tidal volume, inspiratory reserve volume, expiratory reserve volume, and residual volume. Differentiate between inspiratory capacity, functional residual capacity, vital capacity, and total lung capacity.

Chapter 24: The Respiratory
System ??? Identify the organs of the digestive system. Describe the basic processes performed by the digestive system. Describe the structure and function of the layers that form the wall of the gastrointestinal tract. Describe the nerve supply of the GI tract. Describe the peritoneum and its

folds. Identify the locations of the salivary glands, and describe the functions of their secretions. Describe the structure and functions of the tongue. Identify the parts of a typical tooth, and compare deciduous and permanent dentitions. Describe the location and function of the pharynx.

Describe the location, anatomy, histology, and functions of the esophagus. Describe the three phases of deglutition. Describe the location, anatomy, histology, and functions of the stomach. Describe the location, anatomy, histology, and function of the pancreas. Describe the location, anatomy, histology, and functions of the liver and gallbladder. Describe the location, anatomy, histology, and functions of the small intestine. Describe the anatomy, histology, and functions of the large intestine. Describe the three phases of digestion. Describe the major hormones that regulate digestive activities. Describe the development of the digestive system.

Describe the effects of aging on the digestive system. Chapter 25: Metabolism and Nutrition ??? ??? ??? ??? ??? ??? ??? De? ne metabolism. Explain the role of ATP in anabolism and catabolism. Describe oxidation??? reduction reactions. Explain the role of ATP in metabolism. Describe the fate, metabolism, and functions of carbohydrates. Describe the lipoproteins that transport lipids in the blood. Describe the fate, metabolism, and functions of lipids. ??? ??? ??? ??? ??? ??? ??? ??? Describe the fate, metabolism, and functions of proteins. Identify the key molecules in metabolism, and describe the reactions and the products they may form. Compare metabolism during the absorptive and post absorptive states. De? e basal metabolic rate (BMR), and explain several factors that affect it. Describe the factors that in? uence body heat production. Explain how normal body temperature is maintained

by negative feedback loops involving the hypothalamic thermostat. Describe how to select foods to maintain a healthy diet. Compare the sources, functions, and importance of minerals and vitamins in metabolism. Chapter 26: The Urinary

System ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? List the functions of the kidneys. Describe the external and internal gross anatomical features of the kidneys. Trace the path of blood ? ow through the kidneys. Describe the structure of renal corpuscles and renal tubules.

Identify the three basic functions performed by nephrons and collecting ducts, and indicate where each occurs. Describe the ? ltration membrane. Discuss the pressures that promote and oppose glomerular ? ltration. Describe the routes and mechanisms of tubular reabsorption and secretion. Describe how speci? c segments of the renal tubule and collecting duct reabsorb water and solutes. Describe how speci? c segments of the renal tubule and collecting duct secrete solutes into the urine. Describe how the renal tubule and collecting ducts produce dilute and concentrated urine. De? ne urinalysis and describe its importance. De? ne renal plasma clearance and describe its importance.

Describe the anatomy, histology, and physiology of the ureters, urinary bladder, and urethra. Describe the ways that body wastes are handled. Describe the development of the urinary system. Describe the effects of aging on the urinary system. Chapter 27: Fluid, Electrolyte, and Acid-Base Homeostasis ??? ??? ??? ??? Compare the locations of intracellular ? uid (ICF) and extracellular ? uid (ECF), and describe the various ? uid compartments of the body. Describe the sources of water and solute gain and loss, and

explain how each is regulated. Explain how ? uids move between compartments. Compare the electrolyte composition of the three major ? uid compartments: plasma, interstitial ? uid, and intracellular ? uid. ??? ??? ??? ???

Discuss the functions of sodium, chloride, potassium, bicarbonate, calcium, phosphate, and magnesium ions, and explain how their concentrations are regulated. Compare the roles of buffers, exhalation of carbon dioxide, and kidney excretion of H+ in maintaining pH of body ? uids. De? ne acid??? base imbalances, describe their effects on the body, and explain how they are treated. Describe the changes in ? uid, electrolyte, and acid??? base balance that may occur with aging. Chapter 28: The Reproductive System ??? ??? ??? ??? ??? ??? ??? ??? Describe the location, structure, and functions of the organs of the male reproductive system. Discuss the process of spermatogenesis in the testes.

Describe the location, structure, and functions of the organs of the female reproductive system. Discuss the process of oogenesis in the ovaries. Compare the major events of the ovarian and uterine cycles. Explain the differences among the various types of birth control methods and compare their effectiveness. Describe the development of the male and female reproductive systems. Describe the effects of aging on the reproductive systems. Chapter 29: Development and Inheritance ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? ??? Explain the major developmental events that occur during the embryonic period. Describe the major events of the fetal period. De? ne a teratogen and list several examples of teratogens.

Describe the procedures for fetal ultrasonography, amniocentesis, and chorionic villi sampling. Describe the sources and functions of the hormones secreted during pregnancy. Describe the hormonal, anatomical, and physiological changes in the mother during pregnancy. Explain the effects of pregnancy on exercise and of exercise on pregnancy. Explain the events associated with the three stages of labor. Explain the respiratory and cardiovascular adjustments that occur in an infant at birth. Discuss the physiology and hormonal control of lactation. De? ne inheritance, and explain the inheritance of dominant, recessive, complex, and sex-linked traits.