

**BIOLOGY 217
HUMAN ANATOMY & PHYSIOLOGY I
EXAM 1 REVIEW SHEET**

Material Covered on Exam: Chapters 1-4

For this exam, you will be expected to . . .

- Be able to define anatomy and physiology and the subdivisions of each.
- Be able to describe the common functions of life and name the basic requirements necessary to maintain human life.
- Name the different levels of structural organization that make up the human body and explain their relationships.
- List the organ systems of the body, identify their major organs or components, and briefly describe the major functions of each system.
- Define homeostasis and the three components of homeostatic regulation.
- Describe how positive and negative feedback maintains homeostasis. Give at least two examples of each.
- Describe anatomical position.
- Be able to correctly identify root words, prefixes, and suffixes commonly used in anatomy and physiology.
- Be able to correctly identify superficial and regional terms commonly used to indicate locations on or in the body.
- Be able to correctly identify the body directions and planes.
- Locate and name the major body cavities and the subdivisions of each.
- Be able to list the major organs contained within each body cavity and name the membrane lining each cavity.
- Name the nine abdominopelvic regions and list the organs they contain.
- Name the four quadrants of the abdominopelvic cavity and list the organs they contain.
- Differentiate between matter, work, and energy.
- List and describes the different states of matter.
- Define a chemical element and list the elements that make up 96% of body matter and the most common elements that make up the remaining 4%.
- Define atom. List the subatomic particles; describe their relative masses, charges, and location within the atom. 5. Be able to name the first three electron shells and give the maximum number of electrons that each can hold. 6. If given an element from the periodic table, be able to identify the element by its chemical symbol, give its atomic number and atomic mass. Be able to use this information to determine the number of protons, neutrons, and electrons for the element.
- Define neutral atom, isotope, isomer, ion, cation, and anion.
- Draw planetary models of neutral atoms from elements 1 - 20 on the periodic table.
- Explain the role of valence electrons and the octet rule in the formation of chemical bonds. What does it mean if an atom is reactive or inert?

- Distinguish between a compound and a molecule.
- Differentiate between mixtures, covalent bonds, ionic bonds, and hydrogen bonds.
- Compare and contrast polar and non-polar molecules. Give an example of each.
- Be able to describe the components of a chemical reaction, list the rules of chemical notation, and define three basic types of chemical reactions.
- Define endergonic, exergonic, metabolites, inorganic nutrient, and organic nutrients.
- Explain the importance of water in the human body.
- Be able to define the following terms: hydrophobic, hydrophilic, adhesion, cohesion, surface tension, solute, solvent, electrolyte, and hydration sphere.
- Define acids, bases, and neutrals with respect to H^+ and OH^- and explain the concept of the pH scale relative to each.
- Be able to define the term salts and buffers.
- Compare and contrast the monomers, polymers, and biological functions for each of the four organic compounds: carbohydrates, proteins, lipids, and nucleic acids.
- Explain the role of dehydration synthesis and hydrolysis in the formation and breakdown of organic compounds.
- Differentiate between saturated and unsaturated fatty acids.
- Describe the four levels of protein structure.
- Describe the importance of enzymes to chemical reactions and differentiate between the following: substrate, active site, activation energy, denaturation, and catalyst.
- List the components of a nucleotide.
- List the differences between DNA and RNA.
- Define the basic components of the cell theory.
- Describe the structure and design of the plasma membrane and relate its components (various proteins, glycocalyx, and cholesterol) to membrane function.
- Describe the functions of the peripheral and integral proteins.
- Define the function of the various membranous and non-membranous organelles found within the cytoplasm of the cell.
- Describe the structure and function of the nucleus, nuclear envelope, nuclear pores, nucleoplasm, nucleolus, nucleosomes, DNA, histones, chromatin, and chromosomes.
- Compare and contrast passive versus active transport mechanisms.
- Differentiate between diffusion, osmosis, facilitated diffusion, filtration, primary active transport, secondary active transport, and vesicular transport.
- Define solute and solvent and describe their importance in the identification of the three types of tonicity and describe their effects on human cells.
- List the components of the cell life cycle and describe the key events occurring during each: Interphase, G_1 , S, G_2 , G_0 , M, and cytokinesis.
- Describe the process of DNA replication occurring during S of interphase and apply the principles of complimentary base pairing.

- Describe the phases of mitosis: prophase, metaphase, anaphase and telophase.
- Name and describe the two phases of protein synthesis and discuss the roles of DNA, mRNA, rRNA, and tRNA, in each phase.
- Describe the processing of RNA before it leaves the nucleus and the importance of introns, exons, and spliceosomes in the process.
- Describe the role of the following on the process of replication and/or protein synthesis: helicase, DNA polymerase, RNA polymerase, promoter, terminator, codon, anti-codon, ribosome.
- Describe the formation of cancer and how it relates to cell division processes.
- Define the terms: mutation, tumor, apoptosis, benign, malignant, and metastasis.
- Define and differentiate between the terms: histology versus cytology.
- Name the three types of germ tissue and describe the adult tissues into which they differentiate.
- Name the four principle tissue types and briefly describe each.
- Describe the location and function of the various types of membranes of the human body.
- List the structural and functional characteristics common to all epithelial tissue.
- Describe how epithelial tissues are named and classified.
- Indicate the function, location, and description of the different types of epithelial tissue.
- Define the following: gap junctions, desmosomes, hemidesmosomes, adhesion belts, and tight junctions.
- Define gland and differentiate between endocrine versus exocrine as well as the different types of secretory classifications and structural classifications.
- List the common characteristics of all connective tissue.
- Be able to discuss the type of matrix and cell type associated with each type of connective tissue.
- Indicate the function, location, and description of the various types of epithelial tissue found within the body.
- Indicate the function, location, and description of the various types of connective tissue found throughout the body.
- Indicate the function, location, and description of the various types of muscle tissue found throughout the body.
- Indicate the function, location, and description of the various types of nervous tissue found throughout the body.

*****This study guide covers the majority of information on the exam, but possibly not all of it. You are still responsible for any information that was covered in the notes but not put on this guide (intentionally or unintentionally). Good Luck and Study Hard!!***