

Tips for success-

1. **HANDWRITE** out your study guide. Some (very few) students do fine with typing, but most do much better when they handwrite their study guide. If you do a really complete job, your study guide will be 8-15 pages long, depending on the size of your handwriting.
2. **WORK IN GROUPS**, but don't split up the parts among people in a group. The benefits of doing the study guide are gained from actually writing out the answers yourself. It's great to work in groups and discuss the answers with others, but be sure you do your own writing. Besides, if I see exact copies of study guides, no one in the group will get the extra credit for it.
3. Draw yourself diagrams and pictures whenever you can, to illustrate processes. You can redraw the pictures for yourself on your exam and use them as models to answer questions. If you can, create a little "movie" in your head of cellular processes.
4. Focus on learning **processes** rather than just definitions whenever applicable. For example, for the vocabulary term -"photosynthesis" you should not stop at defining it, but should be sure that you understand what kinds of organisms do it, what kind of environmental conditions are required, how the process works, what are the reactants and products, etc.
5. Get a good night's sleep and eat a good breakfast before the exam. An extra hour of sleep will be more valuable than an extra hour of studying if you are exhausted. If you find yourself in this predicament often, then you need to start studying much earlier for the exam. Allow 10-20 hours of total study time for each exam. Whether you do it all at once or in small increments is up to you...

GOOD LUCK!!

Characteristics of Life

1. List and describe the basic characteristics that all living organisms have in common.
2. Describe the basic hierarchy of living systems from atoms to ecosystems.
3. What are chemical elements? Which ones are particularly prevalent in living organisms?
4. Describe each of the following: Molecule, Ion, Isotope, Proton, Electron, Neutron
5. Name and describe the three type of chemical bonds discussed in class.
6. Draw a pH scale with 0, 7 and 14 marked. Indicate where the acids would be. Indicate where the bases would be. Provide 2-3 examples of acids and bases and write them in where they would be on the scale.
7. Name and briefly describe the four macromolecules discussed in class. Know what the monomer is for each and be able to recognize them given a diagram.

Cells

8. What are the basic principals of the cell theory? Why are cells considered the smallest units of life?
9. Name and describe the three domains of biological organization. What are the six kingdoms and what kinds of organisms are in each one? How are kingdoms related to domains?
10. Describe the conventions that are used in naming organisms. What is the difference between a genus and a species and how do we designate each in the name? How do you indicate italics when handwriting an organism's name?
11. Describe the basic characteristics of prokaryotic cells. Describe the basic characteristics of eukaryotic cells. What are the major differences between them?
12. List and describe the basic functions that all cells carry out. Give a couple of examples of specialized cell functions.
13. A. What is cellular respiration? B. Where does it occur? C. What is the general formula for cellular respiration?
14. Describe *in general terms* (three steps) the process of cellular respiration and where in the cell each step occurs. Focus on the starting materials, the waste generated, the carrier molecules involved and the end products.
15. Describe the functions of each of the organelles/cell structures discussed in class. Cell membrane, cilia, flagella, cell wall, nucleus, RER, SER, golgi, mitochondria, lysozomes (and other vesicles), cytoskeleton
16. What are the two primary components of the fluid mosaic model of the cell membrane? Why are these membranes called "fluid mosaics"?
17. List and describe all (diffusion, osmosis, active transport, endo/exocytosis) the ways in which substances can cross cell membranes. In each case describe what types of substances use that method to cross membranes. Be sure to discuss the roles of protein channels and pumps.
18. Define the terms isotonic, hypotonic and hypertonic. Use diagrams if necessary.

Tissues & Anatomical Terminology

1. What is anatomical position? Describe the relative position (e.g. superior/inferior, proximal/distal) terms discussed in class and give examples for each pair.
2. Describe the three major classes of joints discussed in class and give an example for

each.

3. List and describe the movement terms discussed in class (e.g. flexion/extension, pronation/supination). Give examples of joints that do each of the movements.
4. What are the four main tissue types? What is the definition of a tissue? What are tissues made of?
5. What are the primary functions of epithelial tissue? Where is it usually found in the body? What are the main cell types found in epithelial tissues? What is the difference between simple and stratified epithelium?
6. What is transitional epithelium? Where is it found?
7. List the major types of connective tissues discussed in class. What is the characteristic that pretty much all connective tissues have in common? Where do you find areolar conn.tiss., dense conn. tiss. and adipose tissue? Describe the matrix for each.
8. For the specialized connective tissues (blood, bone & cartilage) describe the cells found in each and the matrix of each. What do they have in common?
9. List and describe the three types of muscle tissue. Which one(s) are voluntary and which one(s) are involuntary? Where would you find each in the body?
10. Give some examples of the locations and general functions of nervous tissue.

Musculoskeletal System

1. A. What kind of cells are found in bone tissue? B. What are osteons, central canals and lacunae? What is hydroxyapatite?
2. A. What bones are part of the axial skeleton a. Appendicular skeleton? C. Describe and give examples of the three types of joints: ball/socket, hinge, pivot.
3. A. Describe how tendons are involved in muscle attachment to bone. B. What is meant by antagonistic pairs? 4. A. How are actin and myosin involved in muscle contraction? B. Draw and label a diagram of a sarcomere. Be sure to label the thick and thin filaments.
4. A. How are ATP and Calcium involved in muscle physiology? B. What happens when muscle cells run out of oxygen?
5. A. Describe the process of osteoporosis. B. What nutrients and macromolecules are involved in this pathology?

Nervous System

1. Which parts of the nervous system are responsible for the following functions of the nervous system: sensory input, integration and motor output. B. What are some other overall functions of the nervous system in relation to how the body functions.

2. What are the two major divisions (and their abbreviations) of the nervous system? B. What are these two divisions made up of physically (parts) C. What are the functions of these two divisions?

3. A. The PNS consists of two divisions: the Somatic and Autonomic. What are the overall functions of these two divisions? Give some examples of systems controlled by each. B. The autonomic portion of the PNS is also divided into two different functions: the sympathetic and parasympathetic. What are the overall functions of these two divisions? Give some examples of a systems/structures controlled by each.

4. A. Draw and label a simplified example of a nerve cell (neuron) consisting of the four main parts of the neuron. B. For each of the four parts explain the function(s) of each. C. What is the myelin sheath of a neuron, where does it come from and what does it do for the neuron or nervous function?

5. A. What is meant by a "resting potential"? When does this occur and describe both sides of the plasma membrane during this time. B. What do sodium-potassium pumps do and how do they accomplish this? C. Why is the inside of the cell naturally negative (i.e. what kinds of negatively charged molecules are always inside cells)?

6. A. What is a synapse? B. How can a nerve signal continue when it encounters a synapse? C. What are neurotransmitters and how do they work?

7. A. Name and describe some of the structures that protect your CNS. B. What are some of the major functions of the spinal cord?

8. A Describe the structures and pathways involved in transmitting the impulses of each of the five special senses to the brain. B. What are the two main types of protein channel gates that initiate signals at the sensory receptors? Which sensors have which types?

Digestive System

7. A. Follow the path of food in the alimentary canal in humans (write out in order) and be able to identify them on a diagram. Also, be able to identify the accessory organs that aid in digestion.

8. A. Name and explain the functions(s) of each of the following structures: mouth/oral cavity, teeth, tongue, salivary glands B. Saliva contains the enzyme salivary amylase. What does this enzyme do? C. What types of digestion occurs in the mouth (mechanical/chemical)? Explain.

9. A. Where is the pharynx located? B. What does the epiglottis do when you swallow? C. Describe the structure and function of the esophagus. D. What is peristalsis?

10. A. What are two different functions of the stomach. B. What substances are produced by gastric glands and what are their functions? C. What is the approximate pH of gastric juice? D. Why doesn't your stomach digest itself? F. What is heartburn?

11. A. For each structure listed, explain what part it plays in chemical digestion of food in the small intestine (where it is and what it does/makes): liver, pancreas, gall bladder.

12. A. What is the primary function of the small intestine?

13. A. How do villi and microvilli aid with absorption? B. Draw and describe the structure of a villus. C. Show/describe where fat products are absorbed and where amino acids and sugars are absorbed.

14. A. What is the main function of the large intestine? C. What leads to constipation? diarrhea?