

Study Guide for Exam #1

Basic Building Blocks 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. Define each of the following: Molecule, Ion, Isotope, Proton, Electron, Neutron
5. Name and describe the three types 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.
8. What are the basic tenets 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 five kingdoms and what kinds of organisms are in each one?
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?

Characteristics of Cells

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. Describe the functions of each of the organelles/cell structures discussed in class.
14. What are the two primary components of the fluid mosaic model of the cell membrane?
15. List and describe all (diffusion, osmosis, active transport, endo/exocytosis) the ways in which substances can cross cell membranes. In each case describe what

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- types of substances use that method to cross membranes. Be sure to discuss the roles of protein channels and pumps.
16. Define the terms isotonic, hypotonic and hypertonic. Use diagrams if necessary.
 17. Define homeostasis. Describe the components of a negative feedback mechanism. Describe the components of a positive feedback mechanism.
 18. Describe the homeostatic mechanism that is responsible for regulating your blood glucose level. Include the hormones.
 19. Describe the homeostatic mechanism that is responsible for childbirth. Include the hormones.

Tissues and their Functions

20. What is a tissue? How is it different than an organ?
21. What determines the functions and properties of a tissue?
22. List the four basic tissue types and give a brief description of each. (e.g. what does it do, where is it found in the body, what types of cells/other components does it have, what organs does it make up, does it have any “special” properties?)
23. Describe each of the following: simple epithelium, stratified epithelium, pseudostratified epithelium, squamous cells, cuboidal cells, columnar cells.
24. Name the three basic elements of all connective tissues. What is matrix?
25. Mature (adult) connective tissues are classified into five categories. List each of them and the primary cell type of each.
26. What is a membrane? Name the four types of membranes of the body and describe where each can be found.