

CP Biology Fall Semester Final Exam Study Guide - 2012

Use your notes, textbook, homework, diagrams, labs, and quizzes to answer the following questions. The questions on this study guide are not in any particular order. Answer all questions completely, but remember completing the study guide is only one part of your study strategy. You still need to review concepts, diagrams, and vocabulary. Staple your answers to the back of this page and turn in on day of test. The test will consist of around 75-100 multiple choice questions, so make sure you know each topic listed here in detail.

Chapters covered:

Introduction to Biology: Ch. 1.1 - 1.3

Chemistry: Ch. 2.1 - 2.5

Cells: Ch. 3.1 - 3.5

Energy in cells: Ch. 4.1- 4.6

Nervous/Immune systems: Ch. 29.1, 29.2, 29.4 & 31.1-31.3

Scientific Method: Ch. 1

1. Identify the steps to the scientific method in an experimental situation.
2. Explain the difference between a hypothesis, theory and law.
3. Explain the difference between independent and dependent variables.
4. Explain and identify examples of qualitative and quantitative observations.
5. Identify the characteristics of living things and give examples.
6. Summarize the 4 unifying themes in biology and give examples.

FINAL EXAM DATE:

Chemistry of Life: Ch. 2

7. Define atom, element, compound, ion, and molecule. State the differences between an ionic bond and a covalent bond. Give an example of each.
8. What are the three important properties of water? Briefly explain each. Draw a water molecule with its correct charges. How do solvents, solutes, and solutions relate to each other?
9. Explain the concept of pH and the concentrations in Fig. 2.9.
10. Give the structures and functions of all four organic compounds.
11. What is a monomer? A polymer? Give examples of each.
12. What is a chemical reaction and how do reactants, products and energy bonds relate to it?
13. State the difference between and exothermic and an endothermic reaction. Give an example.
14. What are catalysts and how do they relate to enzymes?
15. Explain how enzymes help chemical reactions to occur (lock and key model).

Cell Structure: Ch 3

16. What are the 3 main parts of cell theory? What organisms are an exception to cell theory (do not meet all 3 requirements)?
17. Explain the contributions of the following scientists to our knowledge of cells: Hooke, Van Leeuwenhoek, Schleiden, Schwann, and Virchow.
18. What structures do all living cells have in common?
19. Describe the structure and function of the mitochondria.
20. Describe the structure and function of the chloroplast.
21. Explain the difference between passive transport and active transport.
22. Explain the process of diffusion. How is osmosis related to diffusion?
23. Describe the processes of endocytosis and exocytosis.
24. How are plant and animal cells different?
25. Describe the structure of the cell membrane, what is the function. How is it different from the cell wall?
26. Explain the function of the endoplasmic reticulum, nucleus, vacuole, ribosome, cytoplasm, Golgi apparatus, lysosomes, and vesicles.
27. Define homeostasis.

Energy in Cells: Ch. 4

28. What biochemical process produces most of the oxygen in the atmosphere?
29. How can you determine gasses present in a solution using the experiments with BTB?
30. What is the purpose of photosynthesis?
31. Explain the difference between the light dependant and light independent reactions.
32. How is the light dependent reaction related to the Calvin cycle?
33. What is the purpose of respiration?
34. Describe what happens in glycolysis, the Kreb's Cycle, and the Electron Transport Chain. How are the three processes related?
35. What are the chemical formulas for glucose, carbon dioxide, oxygen, and water?
36. What are the equations for photosynthesis and respiration (chemical formulas and words)?
37. Explain what causes lactic acid to build up in cells (fermentation).
38. What is required for energy to be produced in the mitochondria?
39. What is the major source of energy used in cells? What molecules produce the most energy, which is broken down most often and quickly for energy, and which is not often used for energy?

Immune/Nervous System: Ch 29 and Ch 31

40. Explain homeostasis and how your body maintains it
41. Describe the function of the endocrine system and communication with the nervous system
42. Describe the divisions of the nervous system and the functions of each
43. Know the structure of a neuron (identify all parts and their jobs)
44. Identify the 3 types of neurons and the function of each
45. Explain the process of an action potential including how the signal is initiated, how it moves down the cell, and how it jumps across the synapse
46. Understand the role of sodium and potassium in an action potential
47. Explain the difference between action potential and resting potential
48. Define pathogen and give examples
49. Know how pathogens are spread
50. Explain germ theory and Pasteur and Lister's contributions
51. Know the lines of defense of the immune system (skin, membranes, blood)
52. Describe cellular and humoral immunity
53. Know the role of the following in the immune response: phagocytes, memory cells, B cells, T cells, antigens, antibodies, interferons
54. Compare and contrast passive and active immunity
55. Understand how vaccines and antibiotics work