BIO 105: Review Questions For Exam 1

Consider the following questions as you study for Exam 1. (This list of study questions is NOT meant to be all-inclusive). Don't forget; you have study questions in your textbook and CD-ROM, too!

Themes of Biology / Scientific Method

- Define "biology".
- What characteristics determine if something is "living"?
- What is meant by the "unity of life"?
- Discuss the importance of Darwin's Theory of Evolution to the discipline of biology.
- Read the AP news article "Americans don't know much about science, and that's cause for concern" (16 June '02).
- What are the steps in the Scientific Method?
- Can a hypothesis be tested? Can one be proved?
- Under what circumstances would a hypothesis be "upgraded" to a theory or law?

Cell Structure and Function

- What is a cell? What are the three components of the Cell Theory?
- Why is microscope technology important in the study of cells?
- Name the two major types of cells. What are the distinguishing characteristics of these two cell types?
- What is an organelle?
- Name the major cellular organelles and their functions. What are some organelles found only in animal cells? What are some organelles found only in plant cells?

Biological Chemistry

- How can water be used to create polymers from monomers? How can water be used to break down polymers to their monomer subunits?
- Define "organic chemistry". Why is carbon such a versatile element?
- Discuss the biological importance of the macromolecules known as carbohydrates, lipids, proteins, and nucleic acids. How are they constructed? What are their roles in organisms? Name some examples of each.
- What is the meaning of metabolism?
- What is the difference between potential energy and kinetic energy? Give a couple of examples of both.
- What is the important role of ATP in living things?
- Why are enzymes considered catalysts? Why must optimum conditions be maintained in order for enzymes to work properly?

Photosynthesis and Respiration

- What is the ultimate source of energy for all organisms on the planet? Which organisms can DIRECTLY tap into that energy? What process allows them to do that?

- Photosynthesis:
    - What is the chemical equation for photosynthesis?
    - What is the fate of each reactant? How are the products derived?
    - What special organelle is used in photosynthesis?
    - What molecules are recycled in the photosynthesis reactions?
- Cellular Respiration:
    - What is the chemical equation for cellular respiration? How does it look compared to the photosynthesis equation?
    - What process must precede cellular respiration AND fermentation? What is the product of that process? Is ATP made?
    - What determines if pyruvate will enter the fermentation reactions or the cellular respiration reactions?
    - Where does the Krebs cycle take place? What happens to pyruvate in the cycle? What things are created in the Krebs cycle?
    - What molecules (from the Krebs cycle) contribute to the electron transport chain? Where is the electron transport chain found? How many ATPs can be made in the chain?
- Fermentation: What products are made by yeasts in fermentation? Animal muscle cells in fermentation?
- Why must we breathe? Why are plants critical to our breathing?