Study Guide

Biology 1310

Exam II

Describe why photosynthesis is essential for the maintenance of life.

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What inorganic molecules are critical for photosynthesis?

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Explain why photosynthesis probably evolved first before aerobic respiration.

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Compare the structures of the chloroplast with the mitochondria.

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Why is glucose necessary for non-photosynthetic organisms?

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What is the role of Oxygen (O_2) in the production of ATP?

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Describe the role of high energy electrons (NADH) during the production of ATP.

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What is meant by the term “primary producers” in a food chain?

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Why can one describe the energy component of a food chain as a pyramid?

Concepts in Biology 1310 Name_____

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26 October 2007

1 (10 pts). Below are two overall equations, which one represents the equation for Photosynthesis and why?

A. $CO_2 + H_2O$ ----------→ Glucose precursor + O_2

B. Glucose + O_2 ----------→ $CO_2 + H_2O$

2. (10 pts). It is hypothesized that when life first evolved, the atmosphere DID NOT contain Oxygen (O_2). So what type of energy conversion process mostly likely developed first and why?

3. (10 pts). In the state standard, the 3rd grade concept is: "Relationship between plants and animals". Based upon our discussion of energy and food chains, what are the important concepts that you would cover in the 3rd grade classroom to help students understand this relationship?

4 (10 pts). Plant cells have chloroplasts and mitochondria whereas animal cells only have mitochondria. According to your understanding of energy production, why should plant cells have both organelles?

5 (10 pts). Answer ONE of these questions for 10 points (NO EXTRA CREDIT FOR MORE THAN ONE!)

A. Both photosynthesis and aerobic respiration make use of the same process for generating ATP. Describe how that process works. Note: remember that this process is in a membrane that is inside the chloroplast and mitochondria.
B. A food chain can contain several levels; define the following levels;
    a. Primary producers
    b. Primary consumer
    c. Secondary consumers
    d. Decomposers