



Biology Test #2
Chapters 6-8

Name _____

I. True/False: Mark T for true, F for false and leave value judgments blank (1).

- _____ 1. All organisms release heat during their metabolic processes.
- _____ 2. An example of kinetic energy is a thoroughbred horse racing around the track.
- _____ 3. Glycolysis occurs in the mitochondria of cells.
- _____ 4. Since humans cannot photosynthesize but can undergo cellular respiration, photosynthesis is not as important a biochemical pathway as respiration.
- _____ 5. The Krebs Cycle makes use of the co-enzymes NAD and FAD.
- _____ 6. The organelle that is active in ATP synthesis is the mitochondrion.
- _____ 7. The overall chemical pathway of photosynthesis is an example of an endergonic reaction.
- _____ 8. All enzymes will operate best at a pH of 8.
- _____ 9. Anaerobic organisms only recover 2 ATP during fermentation of glucose.
- _____ 10. Wavelengths of light absorbed by chlorophylls a and b include those wavelengths in the green range.
- _____ 11. The light independent reaction of photosynthesis follows the light dependent reaction.
- _____ 12. An enzyme is completely used up during a chemical reaction.
- _____ 13. Competitive inhibition occurs between substrate and product at an allosteric site.
- _____ 14. Desert plants use the same type of photosynthesis as plants that grow in the Ozarks during the spring and fall months.
- _____ 15. During carbon dioxide fixation, carbon dioxide joins with oxaloacetate.
- _____ 16. Exergonic reactions require an input of energy to form a more energy rich product.
- _____ 17. Overall, the oxidation of glucose into ATP has an efficiency percentage of 39%.

- ____ 18. The first product of the Calvin Cycle in CAM plants is PGAL, a 3 Carbon molecule.
- ____ 19. Enzymes lower the energy of activation of a reaction by binding the substrate in the Enzyme-Substrate complex.
- ____ 20. Non-competitive inhibition takes place on allosteric sites when a substance such as cyanide binds with a portion of the enzyme other than the active site.

II. Multiple/Choice: Choose the best response to the following.

- ____ 1. Light energy that strikes a pigment can be: a. absorbed b. reflected c. transmitted d. all of the above.
- ____ 2. What are the products of photosynthesis? A. water and oxygen b. glucose and oxygen c. carbohydrate and water d. water and carbon dioxide.
- ____ 3. When the stomates in a leaf close, then: a. carbon dioxide in the air spaces of the leaf decreases b. oxygen in the air spaces in the leaf increases c. C₃ plants carry on photorespiration d. all of the above.
- ____ 4. Which of these processes occur in the cytoplasm? A. the Krebs or Citric Acid Cycle b. the Electron Transport System c. glycolysis d. transition reaction.
- ____ 5. About ____ of the energy in the glucose molecule is captured in ATP through the reactions of cellular respiration. A. 12% b. 39% c. 57% d. 84%.
- ____ 6. What process must happen before fermentation? A. glycolysis b. transition reaction c. citric acid or Krebs cycle d. ETS.
- ____ 7. Exergonic reactions: a. require an input of energy from an outside source b. cause death c. can drive endergonic reactions d. include light dependent reaction of photosynthesis.
- ____ 8. The reactant during the light dependent reaction of photosynthesis is: a. oxygen b. water c. carbon dioxide d. glucose.
- ____ 9. The reactant during glycolysis is: a. oxygen b. water c. carbon dioxide d. glucose.
- ____ 10. Which of the following is characteristic of enzymes?
a. they raise the amount of energy needed to start a reaction
b. they raise the energy of activation by binding with substrate
c. they lower the energy of activation by binding with substrate
d. they lower the amount of energy present in the substrate.
- ____ 11. If a compound is reduced, it gains: a. electrons b. carbon dioxide c. water d. ATP.
- ____ 12. Carbon dioxide enters a plant primarily through: a. roots b. grana c. stomata in the leaf epidermis d. electron transport system.
- ____ 13. Energy stored between the bonds of a glucose molecule is known as: a. kinetic energy b. ATP c. potential energy d. nuclear energy.
- ____ 14. When one thing eats another, the ultimate desired product is: a. carbon dioxide b. water c. glucose d. energy.
- ____ 15. The metabolic pathway common to all cells is: a. glycolysis b. Krebs or Citric Acid Cycle c. photosynthesis d. fermentation.
- ____ 16. In the process of photosynthesis, carbon dioxide is: a. oxidized b. reduced c. fixed

3. Label the important components of an enzyme and the reaction it catalyzes using the terms: Active Site, Enzyme, Enzyme-Substrate Complex, Product, Substrate (Reactant). Is this a synthesis (endergonic) or degradative (exergonic) reaction?
_____ (5pts.)

IV. Matching: match the term in Column A with its definition or description in Column B (10 pts.)

Column A

- _____1. PGAL
- _____2. thylakoid membranes
- _____3. potential energy
- _____4. co-enzyme
- _____5. carbon dioxide

- _____6. entropy
- _____7. ATP
- _____8. RuBP
- _____9. water
- _____10. oxygen

Column B

- a. By-product of photosynthesis
- b. Attaches to carbon dioxide forming an unstable 6 C molecule
- c. Capture sunlight energy
- d. Reactant of the light dependent reactions
- e. Produced in Calvin Cycle, this is the first substrate forming glucose, and other organic molecules
- f. Useable form of energy by cells
- g. Measure of randomness or disorder in a system
- h. Stored energy such as chemical bond energy
- i. Reactant in light independent reactions of photosynthesis
- j. Non-protein organic molecules that assist enzymes by acting as an electron acceptors

V. Short Answer: Answer the following with a brief description, list, drawing, etc. (3 pts. each)

1. Can energy be created or destroyed? When energy changes form, what is released? What is the energy change that takes place during the Light Dependent Reaction of Photosynthesis? The Light Independent Reaction?

3. Some people think that if we pollute or destroy enough of the Earth's systems, we can always go to outer space to live. What do you think of this possibility? Before we are able to live on another planet, what systems must be developed to support life on that planet? Think of what you have learned about photosynthesis, energy, and enzymes in answering this question.

4. List the four stages of aerobic cellular respiration. Which of the stage(s) is/are used by anaerobic organisms such as the bacteria that causes tetanus? How does yeast differ from this anaerobic organism in its energy transactions?

5. Compare and contrast the processes of photosynthesis and cellular respiration as to: organelles involved, reactants, products, energy molecules involved, co-enzymes utilized, etc.