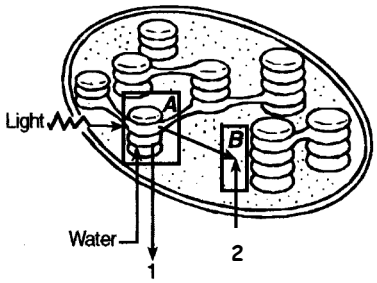
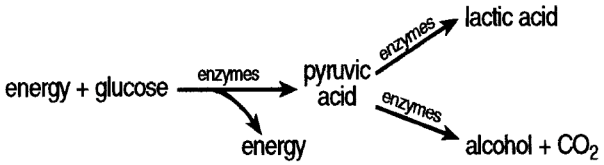
Biology: Cell Energy Practice Test

1. Aerobic respiration requires which three substances:
    a. Pigments, chlorophyll, organic molecules
    b. Oxygen, enzymes, organic molecules
    c. Carbon dioxide, sunlight, water
    d. Enzymes, food molecules, chlorophyll

2. In a chloroplast, light reactions take place in box A, and the Calvin cycle, or dark reactions, take place in box B. Numbers 1 and 2 most likely represent:
    a. 1. Carbon dioxide and 2. glucose
    b. 1. Oxygen and 2. carbon dioxide
    c. 1. Oxygen and 2. glucose
    d. 1. Carbon dioxide and 2. oxygen



The diagram below represents two different pathways of glucose oxidation.



3. These pathways represent:
    a. photosynthesis
    b. the Kreb's cycle
    c. aerobic respiration
    d. anaerobic respiration

4. Plants and animals both use mitochondria for:
    a. Cellular respiration
    b. Fermentation
    c. Photosynthesis
    d. Digestion

5. ATP, or adenosine triphosphate, is important for cell metabolism because it…
    a. Provides chemical energy in an easily used form.
    b. Stores the energy released from aerobic and anerobic pathways
    c. Store potential energy from large organic molecules, like glucose.
    d. All of the above

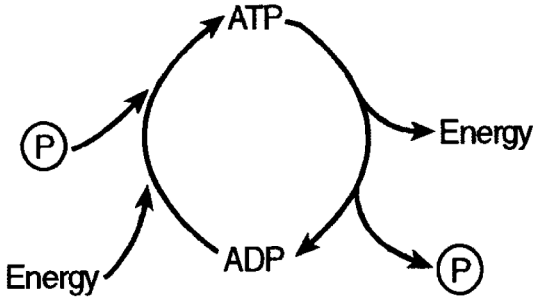
6. Which of the following are <u>output</u> products of aerobic respiration?
    a. Oxygen and water
    b. Carbon dioxide and water
    c. Oxygen and ATP
    d. Carbon dioxide and glucose

7. Yeast cells and sugar are used in bread baking because:
    a. The alcohol product of yeast fermentation gives bread a unique flavor
    b. Yeast cells complete with deadly bacteria and prevent food poisoning
    c. The carbon dioxide product of yeast fermentation creates bubbles that cause the dough to expand and become fluffy.
    d. Yeast cells create oxygen gas bubbles during fermentation and create tiny air pockets in the dough.

8. Which word equation best describes how your body supplies energy to carry out its everyday functions?
    a. Glucose + oxygen → carbon dioxide, water and ATP
    b. Water + carbon dioxide → glucose, oxygen and water
    c. Glucose → alcohol, carbon dioxide, and ATP
    d. Water + enzymes → organic macromolecules, oxygen

9. You are a scientist studying two very different species of bacteria. Species 1 is aerobic and species 2 is anaerobic. Which of the following would you expect?
    a. Species 1 will produce carbon dioxide and water as end products.
    b. Species 2 will produce carbon dioxide and ethyl alcohol as end products.
    c. Species 2 will produce more ATP than species 1.
    d. Both a and b are true
    e. All of the above.

10. The cycle below is important to living organisms because it represents:
    a. a metabolic cycle that does not require enzymes
    b. the conversion of potential energy in large organic molecules into a form easy for cells to use.
    c. A non reversible process producing constant energy for the cell
    d. A transformation of ADP to protein molecules cells can use for energy.



11. During the light reactions of photosynthesis, extra energy is stored in the form of…
    a. Adenosine diphosphate
    b. Adenosine triphosphate
    c. Lactic acid
    d. Ethyl alcohol

12. Light reactions split a molecule to produce hydrogen gas and oxygen. This molecule is:
    a. Water
    b. Carbon dioxide
    c. Glucose
    d. Lactic acid

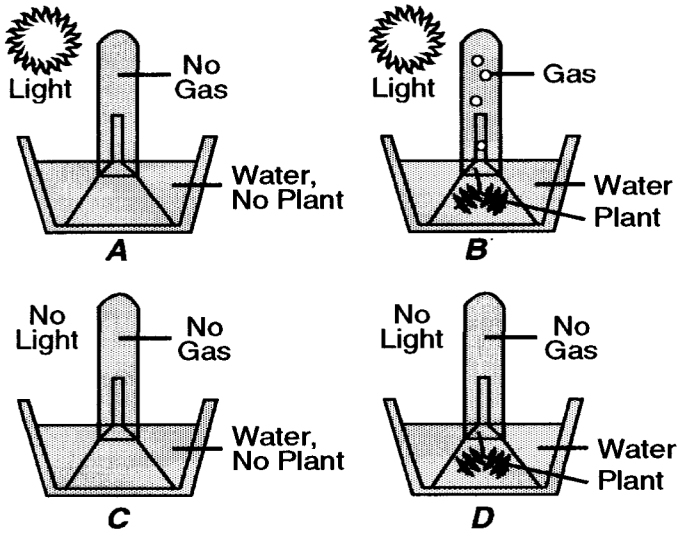
13. Oxygen gas is produced during which stage of photosynthesis?
    a. Calvin Cycle (dark reactions)
    b. Krebs Cycle
    c. Light Reactions
    d. Glycolysis

14. In a plant cell, the process that RELEASES the greatest amount of energy is:
    a. Photosynthesis
    b. Fermentation of glucose
    c. Aerobic respiration of glucose
    d. Calvin Cycle

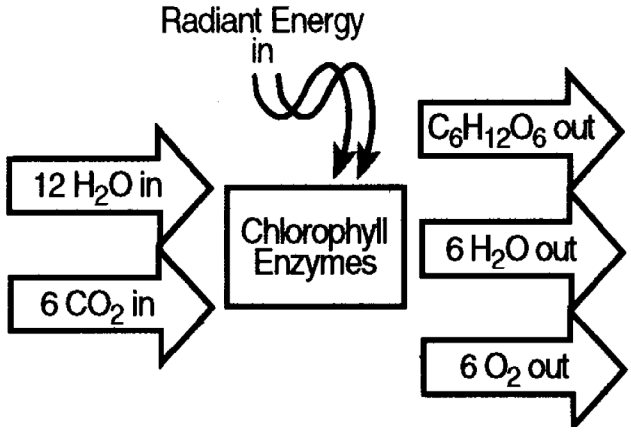
15. During vigorous exercise, human muscle cells begin to produce lactic acid and ache. Which of the following best explains why?
    a. Not enough oxygen is getting to the cells, so ATP is produced through fermentation and lactic acid is a by product.
    b. There is not enough glucose for muscle cells to metabolize for energy, so lactic acid is produced to digest nearby muscle proteins.
    c. Not enough oxygen is getting to the cells, so lactic acid is secreted to neutralize the ethyl alcohol being produced through fermentation.
    d. None of the above

16. In addition to sunlight, what are the INPUT products for photosynthesis?
    a. Glucose, CO_2 and H_2O
    b. CO_2 and H_2O
    c. CO_2, O_2 and N_2
    d. Glucose and O_2

17. The following diagram represents an experiment designed to investigate gas release during photosynthesis. All set ups were maintained at 25 degrees Celcius for 10 hours. Which of the following best explains the presence of gas bubbles in treatment B?
    a. The presence of light indicates that oxygen gas is being produced by photosynthesis.
    b. The presence of the plant indicates the carbon dioxide gas is being produced by cellular respiration.
    c. Hydrogen gas bubbles are being produced from the splitting of water molecules.
    d. None of the above.



18. The process illustrated below occurs in the:
    a. Lysosome
    b. Mitochondria
    c. Chloroplast
    d. Nucelus



KEY

1. b
2. b
3. d
4. a
5. d
6. b
7. c
8. a
9. d
10. b
11. b
12. a
13. c
14. c
15. a
16. b
17. a
18. c