**Study Guide Unit 6: Cell Transport and Energy Conversion (Ch. 4-5)**

**All statements are false. Please correct the statement to make it true. You can rewrite it or just fix wrong part.**

\_\_\_\_ 1. During photosynthesis, carbon dioxide and sugars, in the presence of light, are used to form water and oxygen gas.

\_\_\_\_ 2. Photosynthesis is a process that takes place in heterotrophs.

\_\_\_\_ 3. Species A always produces carbon dioxide, which means it is an autotroph.

\_\_\_\_ 4. The role of cellular respiration in plants is to absorb oxygen.

\_\_\_\_ 5. The main function of leaves is to provide a place for cellular respiration to occur.

\_\_\_\_ 6. Cellular respiration produces oxygen, while photosynthesis uses oxygen.

**Multiple Choice**

*Identify the letter of the choice that best completes the statement or answers the question.*

\_\_\_\_ 7. Most of the energy used by life on Earth comes from

|  |  |
| --- | --- |
| a. | the sun. |
| b. | the rotation of the Earth. |
| c. | the moon. |

\_\_\_\_ 8. Heterotrophs are organisms that

|  |  |
| --- | --- |
| a. | produce food from inorganic molecules or sunlight. |
| b. | can survive without energy. |
| c. | must consume other organisms to get energy. |

\_\_\_\_ 9. Low temperatures may cause photosynthesis to occur

|  |  |
| --- | --- |
| a. | at a constant rate. |
| b. | more slowly. |
| c. | more quickly. |

\_\_\_\_ 10. Cells produce ATP most efficiently in the presence of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | oxygen. | c. | water. |
| b. | glucose. | d. | carbon dioxide. |

\_\_\_\_ 11. Many autotrophs obtain the energy they need for metabolism through

|  |  |  |  |
| --- | --- | --- | --- |
| a. | exocytosis. | c. | eating food. |
| b. | photosynthesis. | d. | cellular respiration. |

\_\_\_\_ 12. Chemical energy stored in food molecules is released through

|  |  |
| --- | --- |
| a. | cellular respiration. |
| b. | endocytosis. |
| c. | photosynthesis. |

\_\_\_\_ 13. When cells break down food molecules, energy is

|  |  |
| --- | --- |
| a. | released entirely as body heat into the environment. |
| b. | temporarily stored in ATP molecules. |
| c. | released all at once. |

\_\_\_\_ 14. As light intensity increases, the rate of photosynthesis

|  |  |
| --- | --- |
| a. | decreases until the light saturation point is reached. |
| b. | decreases indefinitely. |
| c. | increases indefinitely. |
| d. | increases until the light saturation point is reached. |

\_\_\_\_ 15. Light energy is converted to chemical energy through the process of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | glycolysis. | c. | photosynthesis. |
| b. | fermentation. | d. | cellular respiration. |

\_\_\_\_ 16. The energy in the food produced by autotrophs or taken into the

bodies of heterotrophs must be changed into a form that cells can use.

The energy-transferring molecule used by cells is

|  |  |
| --- | --- |
| a. | Oxygen |
| b. | Carbon Dioxide |
| c. | ATP |
| d. | ETC |

\_\_\_\_ 17. Are fungi autotrophs or heterotrophs?

|  |  |
| --- | --- |
| a. | Autotrophs |
| b. | Heterotrophs |

\_\_\_\_ 18. Why do yeast need sugar to make bread rise?

|  |  |
| --- | --- |
| a. | They are heterotrophs and sugar is their food. |
| b. | They are autotrophs. |
| c. | The sugar needs to eat the yeast. |
| d. | None of the above |

\_\_\_\_ 19. Why are humans heterotrophs?

|  |  |
| --- | --- |
| a. | They use sunlight to grow food. |
| b. | They cannot photosynthesize. |
| c. | They must eat meat. |
| d. | They don’t eat plants. |

\_\_\_\_ 20. Which of the following process do autotrophs use?

|  |  |
| --- | --- |
| a. | photosynthesis |
| b. | cellular respiration |
| c. | both a and b |
| d. | none of the above |

\_\_\_\_ 21. Which of the following cellular processes do heterotrophs use?

|  |  |
| --- | --- |
| a. | photosynthesis |
| b. | cellular respiration |
| c. | both a and b |
| d. | none of the above |

\_\_\_\_ 22. What is the major type of atmospheric gas plants give off?

|  |  |
| --- | --- |
| a. | carbon dioxide |
| b. | oxygen |
| c. | none of the above |

\_\_\_\_ 23. Which of the following is a product of photosynthesis but is also a reactant of cellular respiration?

|  |  |
| --- | --- |
| a. | carbon dioxide |
| b. | oxygen |
| c. | hormones |
| d. | chlorophyll |

\_\_\_\_ 24. What kind of respiration do yeast carry out?

|  |  |
| --- | --- |
| a. | aerobic respiration |
| b. | anaerobic respiration |
| c. | fermentation |
| d. | both b and c |

\_\_\_\_ 25. Which of the following is an adaptation plants have to help them remove carbon dioxide from the atmosphere?

|  |  |
| --- | --- |
| a. | small leaves |
| b. | large leaves |
| c. | deep roots |
| d. | colorful flowers |

\_\_\_\_ 26. Which of the following statements is correct?

|  |  |
| --- | --- |
| a. | Cellular respiration stores ATP, photosynthesis releases ATP. |
| b. | Cellular respiration releases energy, photosynthesis stores energy. |
| c. | Cellular respiration uses produces carbon dioxide, photosynthesis uses carbon dioxide |

\_\_\_\_ 27. Scientists hypothesize that oxygen began to accumulate in the Earth’s atmosphere after the appearance of living things with the ability to

|  |  |
| --- | --- |
| a. | form tissues |
| b. | reproduce sexually |
| c. | breath air |
| d. | photosynthesize |

\_\_\_\_ 28. When you work out, your muscles have an increased need for energy. To help supply the body with enough energy, your body will

|  |  |
| --- | --- |
| a. | take in more carbon dioxide |
| b. | increase breathing rate |
| c. | both a and b |
| d. | none of the above |

\_\_\_\_ 29. Which type of cellular respiration does this chemical formula represent?

C6H12O6 + 6O2  6CO2 + 6H2O + ATP

|  |  |
| --- | --- |
| a. | aerobic |
| b. | anaerobic |
| c. | fermentation |

**Completion**

*Fill in the blank with the word that best completes each sentence or statement.*

30. The 3 products of cellular respiration are carbon dioxide, ATP, \_\_\_\_\_\_\_\_\_\_\_\_.

31. Three factors affecting the rate of photosynthesis are light intensity, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ concentration, and temperature.

32. Heterotrophs get energy from food through the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Short Answer**

33. **Circle** the reactants (what goes in) of PHOTOSYNTHESIS and underline the products (what comes out).

Oxygen

Carbon Dioxide

Water

Sugar

**Problem**

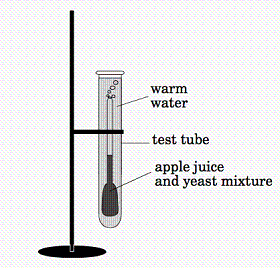
34. Please put the stages of each process in order under the correct heading below. Then write down next to each where eac takes place.

**PS II, Glycolysis, PS I, Krebs Cycle, Calvin Cycle,**

**Electron Transport Chain**

Photosynthesis Cellular Respiration

35. The picture below is an experiment that tests what is produced in a test tube when you combine yeast, apple juice, and water. Looking at the picture below, please explain the following:



What kind of organism are yeast (autotrophs or heterotrophs)?

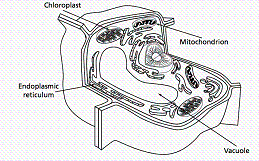
What is the apple juice providing for the yeast?

Why is the water warm and not cold?

What type of gas do the bubble represent?

36. Using the picture below, correctly label which process takes place in certain organelles.

Cellular Respiration, Photosynthesis.



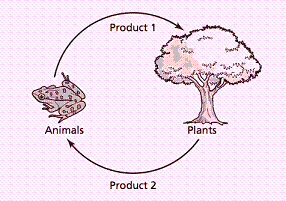
37. What are the 2 products of photosynthesis?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38. What are the two reactants (beginning things) of cellular respiration?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

39. Fill in the correct products on the picture below.



40. Place (increasing or decreasing) arrows in each sentence below to complete it.

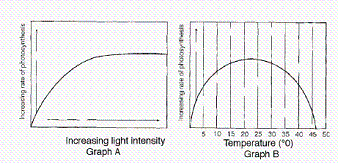
Low temperatures cause the rate of photosynthesis to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Warmer water causes yeast to rise at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate.

When fall and winter time comes the rate of photosynthesis \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In the presence of oxygen \_\_\_\_\_\_\_\_\_\_ ATP is made than during anaerobic respiration.

41. Refer to the illustration below.



Explain what happens to the rate of photosynthesis as light intensity increases?

Why does the rate of photosynthesis increase and then decrease as the temperature changes (think seasons)

**Study Guide Unit 4: Cell Transport and Energy Conversion (Ch. 4-5)**

**Answer Section**

**TRUE/FALSE**

1. ANS: F

Switch: sugars with water

DIF: I OBJ: 5.2.3

2. ANS: F

Switch: heterotroph with autotroph

DIF: I OBJ: 5.2.1

3. ANS: F

Switch autotroph to heterotroph

4. ANS: F

to produce ATP

5. ANS: F

Switch cellular respiration to photosynthesis.

6. ANS: F

Switch cellular respiration and photosynthesis.

**MULTIPLE CHOICE**

7. ANS: A DIF: I OBJ: 5.1.1

8. ANS: C DIF: I OBJ: 5.1.2

9. ANS: B DIF: I OBJ: 5.2.4

10. ANS: A DIF: I OBJ: 5.3.4

11. ANS: B DIF: I OBJ: 5.1.2

12. ANS: A DIF: I OBJ: 5.3.1

13. ANS: B DIF: I OBJ: 5.1.3

14. ANS: D DIF: I OBJ: 5.2.4

15. ANS: C DIF: I OBJ: 5.2.1

16. ANS: C

17. ANS: B

18. ANS: A

19. ANS: B

20. ANS: C

21. ANS: B

22. ANS: B

23. ANS: B

24. ANS: D

25. ANS: B

26. ANS: C

27. ANS: D

28. ANS: B

29. ANS: A

**COMPLETION**

30. ANS: water

DIF: II OBJ: 5.3.4

31. ANS: carbon dioxide

DIF: I OBJ: 5.2.4

32. ANS: cellular respiration

DIF: I OBJ: 5.1.2

**SHORT ANSWER**

33. ANS:

**Circle** the reactants (what goes in) of photosynthesis and underline the products (what comes out).

Oxygen

**Carbon Dioxide**

**Water**

Sugar

**PROBLEM**

34. ANS:

Photosynthesis Cellular Respiration

**PS II** (chloroplast) **Glycolysis** (in cytoplasm)

**PS I** (chloroplast) **Krebs Cycle** (mito)

**Calvin Cycle** (chloroplast) **ETC** (mito)

35. ANS:

What kind of organism are yeast (autotrophs or heterotrophs)?

Heterotroph

What is the apple juice providing for the yeast?

Food

Why is the water warm and not cold?

Cellular Respiration works best in warm temperatures.

What type of gas do the bubble represent?

Carbon Dioxide

36. ANS:

Cellular Respiration-Mitochondria

Photosynthesis-Chloroplast

37. ANS:

oxygen & glucose/sugar

38. ANS:

sugar/glucose, oxygen

39. ANS:

Product 1- Carbon Dioxide

Product 2- Oxygen

40. ANS:

Low temperatures cause the rate of photosynthesis to decrease

Warmer water causes yeast to rise at a increased rate.

When fall and winter time comes the rate of photosynthesis decreased.

In the presence of oxygen more ATP is made than during anaerobic respiration.

41. ANS:

Light intensity increases to a certain point then levels off.

Decreased temperature means not as much light during the day so plants have less time to do photosynthesis.