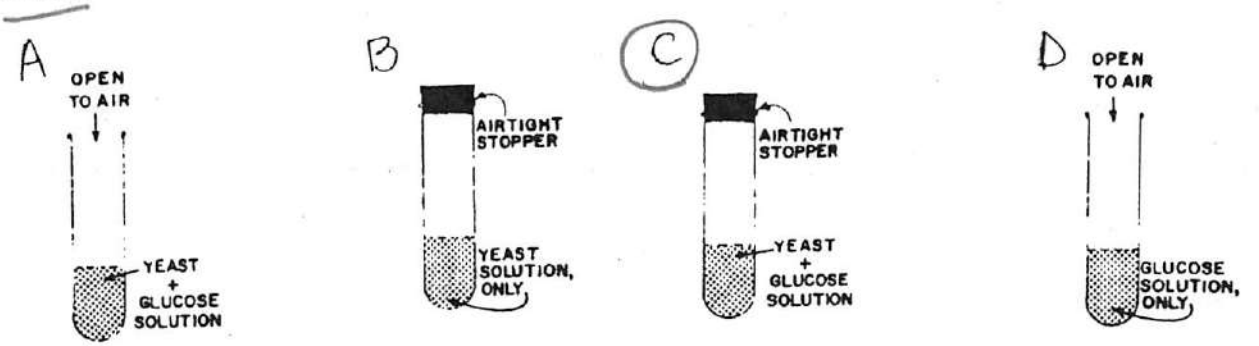
Name _____ Date _____

Cell Respiration Review Packet Bio 512

If the test tubes represented in the diagrams below were allowed to stand at room temperature for several hours, which test tube would most likely contain the greatest amount of alcohol and carbon dioxide?



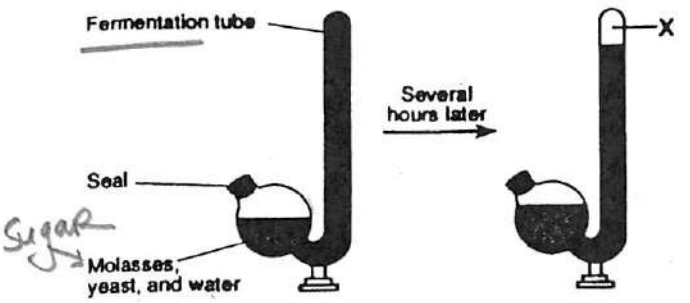
2. Which word equation represents a type of fermentation?
   a. carbon dioxide + water → glucose + oxygen + water
   b. glucose → lactic acid + energy
   c. starch + water → simple sugars
   d. glucose + oxygen → carbon dioxide + water + energy

3. The production of alcohol by yeast cells is the result of
   a. dehydration synthesis b. aerobic respiration c. fermentation d. hydrolysis

4. Lactic acid may be formed as a result of the process of
   a. photosynthesis b. aerobic respiration c. hydrolysis d. anaerobic respiration

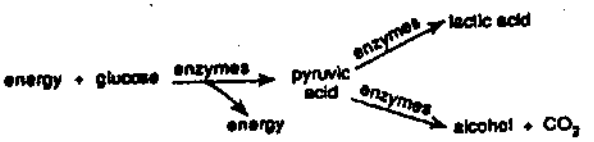
5. Base your answer to the following question on the information and diagram below.

   A student conducted an investigation on fermentation. Yeast, molasses and water were combined in a fermentation tube and left for several hours at room temperature. The results are shown below.



   Which substance would most likely be found in the greatest amount in area X?
   a. O_2 b. CO_2 c. H_2O d. $C_6H_{12}O_6$

Base your answer to question 6 on the diagram below which represents two different pathways of glucose oxidation (breakdown).

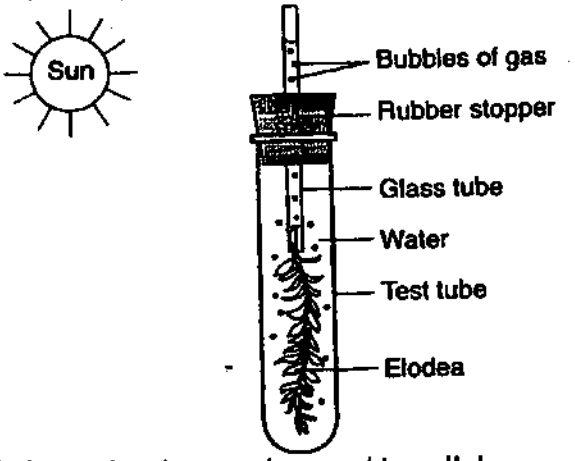


NO O_2

6. The two pathways represented are examples of a process known as
   a. Calvin Cycle (b.) anaerobic respiration c. anaerobic respiration d. photosynthesis

7. One type of anaerobic respiration results in the production of
   (a.) alcohol and carbon dioxide c. pyruvic acid
   b. water and oxygen d. nitrogen gas and ammonia

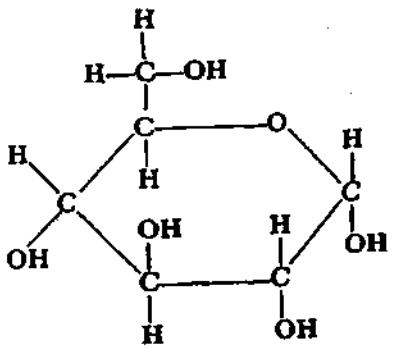
8. Base your answer to the question on the diagram below and on your knowledge of biology. The diagram shows an investigation performed over a period of 12 hours.



O_2

The gas released in this investigation can be used in cellular respiration to form an energy-storing compound known as
a. O_2 b. CO_2 c. H_2O (d.) adenosine triphosphate (ATP)

9. Base your answer to the following question on the structural formula below.



The complete aerobic oxidation of this compound produces
a. amino acids and urea c. glycerol and fatty acids
b. ethyl alcohol and carbon dioxide (d.) carbon dioxide and water

10. Which process is directly responsible for the synthesis of adenosine triphosphate molecules? ATP
a. circulation b. excretion c. respiration d. digestion

11. All producers and consumers use the chemical process of respiration to synthesize
a. oxygen b. ATP c. alcohol d. $C_6H_{12}O_6$

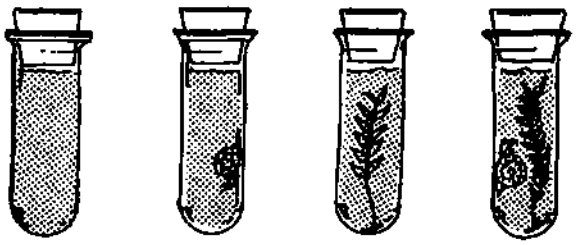
12. What is represented by X in the summary equation for aerobic respiration below?

$$\text{glucose + oxygen} \xrightarrow{\text{enzymes}} \text{water + carbon dioxide + X}$$

a. ethyl alcohol b. lactic acid c. ADP d. ATP 36

13. Base your answer to the following question on the information and diagrams below.

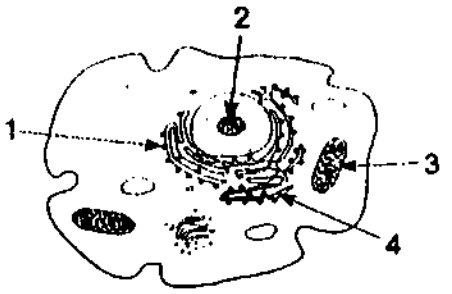
In an investigation of the cycling of environmental gases, a student placed water and bromthymol blue in each of four test tubes as shown in the diagrams below. No additional items were placed in tube 1, a snail was placed in tube 2, an aquatic plant (elodea) was placed in tube 3, and both a snail and an elodea was placed in tube 4. The tubes were then stoppered and placed in bright light for 24 hours.



The most probable explanation for a color change in tube 2 is that
a. water was released by the snail c. the snail's body temperature increased
b. oxygen was removed from the water d. carbon dioxide was added to the water ↑released

14. What is a direct result of aerobic respiration?
a. Alcohol is produced by yeast and bacteria.
b. The enzymes for anaerobic respiration are produced and stored in lysosomes.
c. The potential energy of glucose is transferred to ATP.
d. Lactic acid is produced in muscle tissue.

15. In the diagram of a cell shown below, which number indicates the structure in which most of the enzymes involved in aerobic cellular respiration function?



a. 1 b. 4 c. 3 d. 2

16. In heterotrophs, energy for the life processes comes from the chemical energy stored in the bonds of
a. inorganic molecules
b. water molecules
c. oxygen molecules
d. organic molecules $C_6H_{12}O_6$

17. Living organisms must be able to obtain materials, change the materials into new forms, remove poisons, and move needed material from one place to another. Many of these activities directly require
a. the synthesis of DNA
b. energy released from ATP
c. the breakdown of energy-rich inorganic molecules
d. carbohydrates formed from receptor molecules

18. The production of energy-rich ATP molecules is the direct result of
a. copying coded information during the process of protein synthesis
b. releasing the stored energy of organic compounds by the process of respiration
c. breaking down starch by the process of digestion
d. recycling light energy to be used in the process of photosynthesis

19. The closing of stomates on a leaf would have the *least* effect on the
a. diffusion of carbon dioxide into the atmosphere
b. size of the glucose molecules within the cell
c. diffusion of oxygen molecules into the leaf
d. release of water vapor from the leaf

Questions

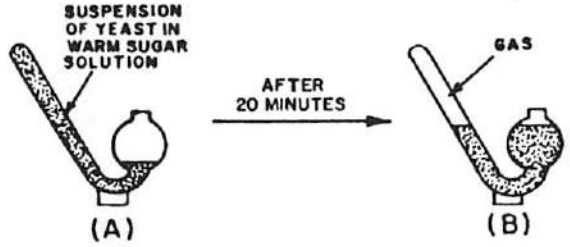
1 Certain organisms break down glucose in a series of enzyme-controlled reactions. This series of reactions, which results in the production of alcohol and carbon dioxide, is an example of
1 dehydration synthesis
2 anaerobic respiration
3 hydrolysis
4 photosynthesis

2 A product of cellular respiration is
1 oxygen
2 ATP
3 PCB
4 glucose

3 During the process of aerobic respiration, energy stored in food is transferred to molecules of
1 ATP
2 DNA
3 glucose
4 enzymes

4 The energy released from the anaerobic respiration of a glucose molecule is less than that released from the aerobic respiration of a glucose molecule because
1 fewer bonds of the glucose molecule are broken in anaerobic respiration than in aerobic respiration
2 more enzymes are required for anaerobic respiration than for aerobic respiration
3 anaerobic respiration occurs 24 hours a day while aerobic respiration can only occur at night
4 anaerobic respiration requires oxygen but aerobic respiration does not require oxygen

5 In the diagram, what gas is probably present in fermentation tube *B*?



1 O_2 2 N_2 3 CO_2 4 CO

6 Most animals make energy available for cell activity by transferring the potential energy of glucose to ATP. This process occurs during
1 aerobic respiration, only
2 anaerobic respiration, only
3 both aerobic and anaerobic respiration
4 neither aerobic nor anaerobic respiration

7 Water is a metabolic by-product produced by animals during
1 respiration, only
2 dehydration synthesis, only
3 both respiration and dehydration synthesis
4 neither respiration nor dehydration synthesis

8 Which of the following processes releases the greatest amount of energy?
1 the oxidation of one glucose molecule to lactic acid molecules
2 the oxidation of one glucose molecule to carbon dioxide and water
3 the conversion of two glucose molecules to a maltose molecule
4 the conversion of one glucose molecule to alcohol and carbon dioxide

9 The site of aerobic cellular respiration is the
1 nucleus
2 ribosome
3 chromosome
4 mitochondrion

10 Compared to a cell that is carrying on anaerobic respiration, a cell that is carrying on aerobic respiration
1 uses less oxygen
2 produces more ATP
3 uses less carbon dioxide
4 produces more alcohol

11 Which process is illustrated by the summary equation below?

glucose + oxygen → water + carbon dioxide + 36 ATP

1 hydrolysis
2 photosynthesis
3 dehydration synthesis
4 aerobic respiration

12 Two end products of aerobic respiration are
1 oxygen and alcohol
2 carbon dioxide and water
3 oxygen and water
4 carbon dioxide and oxygen

13 The aerobic respiration of a molecule of glucose releases more energy than the anaerobic respiration of a molecule of glucose because in aerobic respiration
1 carbon dioxide is used.
2 oxygen is released.
3 more chemical bonds are broken.
4 lactic acid is formed.

Base your answers to questions 14 and 15 on the equation below concerning anaerobic cellular respiration.

$$\text{glucose} + 2X \xrightarrow{\text{enzymes}} 2 \text{ pyruvic acid} + 4 \text{ ATP}$$

14 The substance indicated by X is
1 O_2
2 H_2O
3 ATP
4 CO_2

15 In muscle cells, the pyruvic acid can be converted to
1 lactic acid
2 alcohol
3 oxygen
4 chlorophyll

2. Gas Exchange

Gas exchange involves the diffusion of gases between the organism and its environment. Oxygen diffuses inward, and carbon dioxide diffuses outward, both through the plasma membrane.