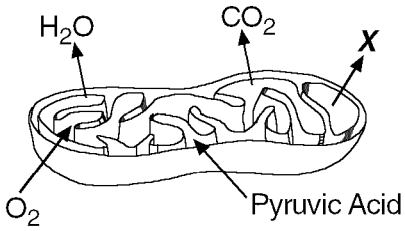
Name: _____

1) Which process involves the transfer of energy from carbohydrates to ATP molecules?
   1) cyclosis
   2) egestion
   3) photosynthesis
   4) respiration

Questions 2 and 3 refer to the following:

The diagram below represents a mitochondrion.



2) All the arrows are associated with the process of
   1) carbon fixation
   2) anaerobic respiration
   3) aerobic respiration
   4) photochemical reaction

3) Letter *X* most likely represents
   1) lactic acid
   2) ATP
   3) PGAL
   4) maltose

4) For the following phrase, select the biological process that is most closely related to the phrase.

   Results in a net gain of 36 ATP molecules and gives off CO_2 and H_2O
   1) Aerobic respiration
   2) Photochemical reactions
   3) Fermentation
   4) Carbon fixation

5) Which substances are produced as a result of the process of aerobic respiration?
   1) carbon dioxide and water
   2) oxygen and water
   3) carbon dioxide and glucose
   4) oxygen and adenosine triphosphate

6) Which three substances must be present in mitochondria for the process of aerobic respiration to take place?
   1) food molecules, enzymes, and carbon dioxide
   2) oxygen, enzymes, and chlorophyll
   3) chlorophyll, enzymes, and carbon dioxide
   4) oxygen, enzymes, and organic molecules

7) For the following phrase, select the biological process that is most closely related to the phrase.

   Requires O_2
   1) Photochemical reactions
   2) Carbon fixation
   3) Fermentation
   4) Aerobic respiration

8) In a bean plant, which reaction will release the *greatest* amount of energy?
   1) hydrolysis of a cellulose molecule
   2) synthesis of a chlorophyll molecule
   3) aerobic respiration of a glucose molecule
   4) anaerobic respiration of a glucose molecule

9) In plant cells, which organelle is most closely associated with aerobic respiration?
   1) nucleolus
   2) mitochondrion
   3) lysosome
   4) chloroplast

10) Two species of bacteria produce different respiratory end products. Species *A* always produces ATP, CO_2, and H_2O; species *B* always produces ATP, ethyl alcohol, and CO_2.

    Which conclusion can correctly be drawn from this information?
    1) Species *A* and species *B* are both aerobic.
    2) Only species *B* is aerobic.
    3) Only species *A* is aerobic.
    4) Species *A* and species *B* are both anaerobic.

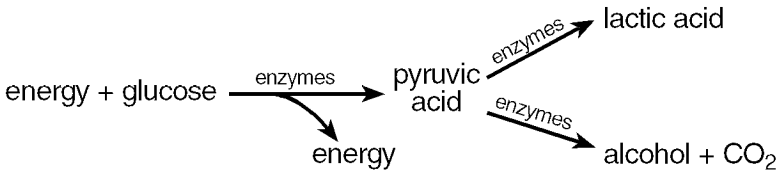
11) Molecular oxygen is used most directly by many living organisms in a process that involves the
    1) production of water molecules from dehydration synthesis
    2) synthesis of glucose molecules
    3) transfer of potential energy from glucose to ATP
    4) hydrolysis of polypeptide molecules

12) For the following phrase, select the biological process that is most closely related to the phrase.

    Occurs in yeast and results in a net gain of 2 ATP
    1) photochemical reactions
    2) aerobic respiration
    3) fermentation
    4) carbon fixation

13) Yeast cells produce carbon dioxide and alcohol as a result of
    1) dehydration synthesis
    2) photosynthesis
    3) fermentation
    4) aerobic respiration

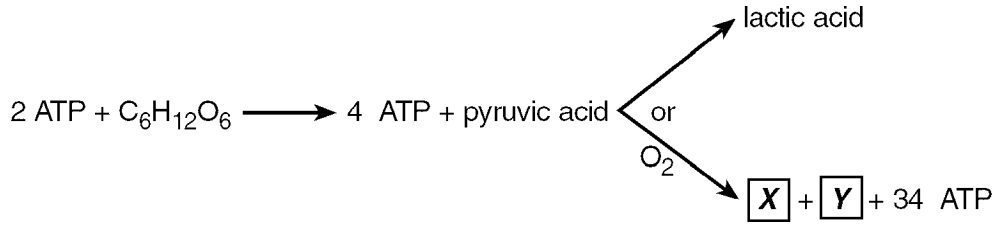
14) The diagram below represents two different pathways of glucose oxidation.



The two pathways represented are examples of a process known as

1) carbon fixation
2) aerobic respiration
3) photosynthesis
4) anaerobic respiration

15) The equation below includes two respiration reactions that occur in human muscle tissue.

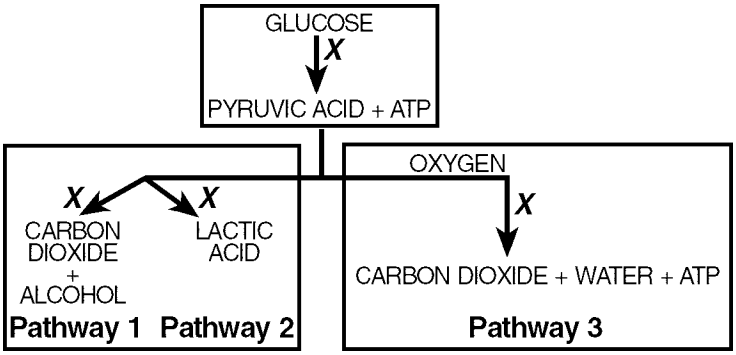


The products represented by letters *X* and *Y* are most likely

1) alcohol and ammonia
2) water and carbon dioxide
3) starch and RNA
4) pyruvic acid and ADP

Questions 16 through 18 refer to the following:

The diagram below shows three different pathways for the breakdown of glucose to release energy.



16) Which process is represented by pathways 1 and 2?

1) aerobic respiration
2) carbon fixation
3) anaerobic respiration
4) photolysis

17) The *greatest* amount of energy from the breakdown of a single glucose molecule would he released by

1) pathway 2, only
2) pathways 1 and 2
3) pathway 3, only
4) pathway 1, only

18) The substances represented by *X* enable the reactions involved in the pathways to occur rapidly. These substances are examples of

1) neurotransmitters
2) hormones
3) enzymes
4) substrates

19) After it is produced by an autotroph, glucose can be

1) combined with three fatty acids to form a lipid
2) utilized to capture light energy from the Sun
3) used as an energy source in cellular respiration
4) converted into storage products by hydrolysis

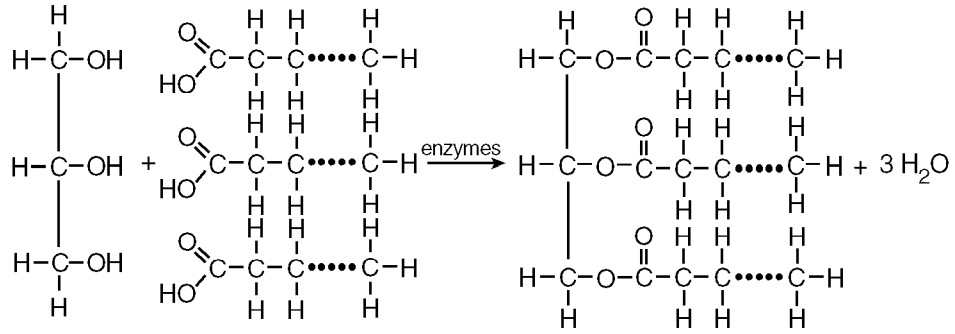
20) A final result of the process of respiration in animals is the

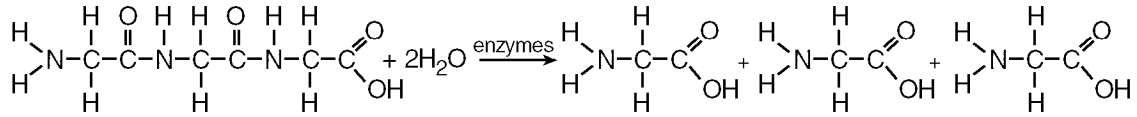
1) release of oxygen as a waste product
2) enzymatic decomposition of inorganic molecules
3) transfer of chemical energy to a more usable form
4) use of carbon dioxide to form sugars

21) The presence of lactic acid in human muscle tissue would most likely be the result of

1) protein hydrolysis
2) a decrease in carbon dioxide
3) enzyme action in lysosomes
4) anaerobic respiration

22) Which reaction is most closely related to muscle fatigue in humans?

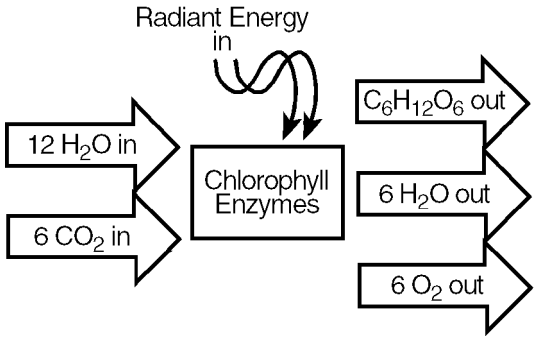
1) 

2) 

3) 2 ATP → glucose $\xrightarrow{\text{enzymes}}$ 2 pyruvic acid $\xrightarrow{\text{enzymes}}$ 2 lactic acid → 4 ATP

4) 2 ATP → glucose $\xrightarrow{\text{enzymes}}$ 2 pyruvic acid + oxygen $\xrightarrow{\text{enzymes}}$ carbon dioxide + water + 34 ATP → 4 ATP

23) Which process is *best* illustrated by the diagram?



1) respiration
2) photosynthesis
3) hydrolysis
4) transpiration

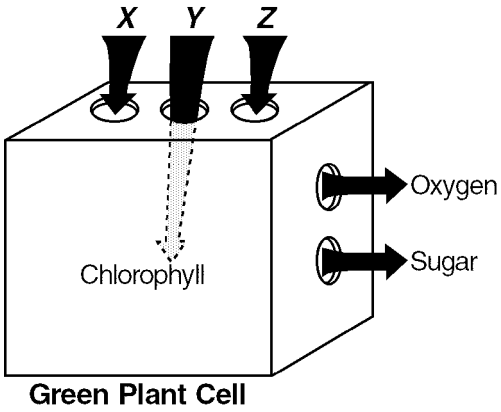
24) Photosynthesis transforms molecules of water and carbon dioxide into molecules of

1) carbohydrate and nitrogen
2) polypeptide and nitrogen
3) carbohydrate and oxygen
4) polypeptide and oxygen

25) Green plants usually do *not* excrete large amounts of CO_2 because they use CO_2 in the process of

1) photosynthesis
2) transpiration
3) anaerobic respiration
4) hydrolysis

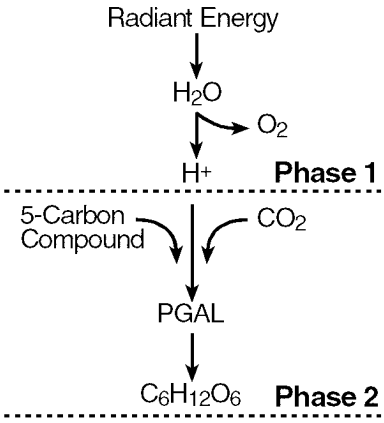
26) The diagram below represents some of the events that take place in a plant cell.



The letters *X*, *Y*, and *Z* most likely represent

1) light, O_2, and methane
2) light, ammonia, and H_2O
3) N_2, O_2, and H_2O
4) CO_2, light, and H_2O

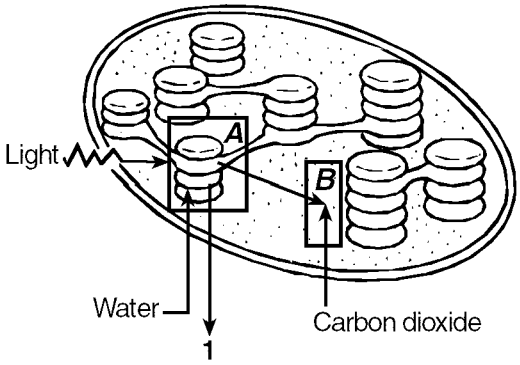
27) The diagram below represents some metabolic reactions of an organism.



In which organisms does phase 1 occur?

1) mushrooms
2) yeast
3) trees
4) fish

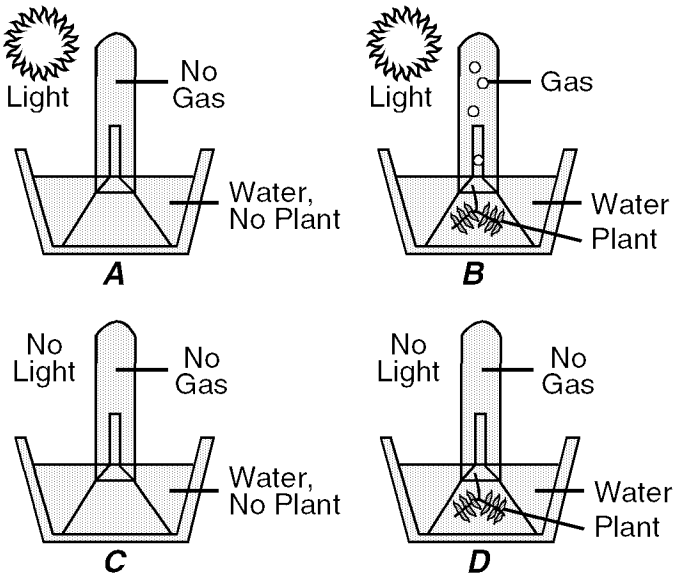
28) The diagram below represents some metabolic activities in a chloroplast.



Which substance diffuses in the direction of arrow 1 after it is formed in the structure represented in area *A*?

1) starch
2) glucose
3) oxygen
4) carbon dioxide

29) The diagram below shows four setups used in an attempt to investigate the release of a gas during photosynthesis. Each setup was maintained at 25DC for a period of 10 hours.



What was a variable in this experiment?

1) temperature
2) time
3) light
4) water

30) Twenty-five geranium plants were placed in each of four closed containers and then exposed to the light conditions shown in the data table below. All other environmental conditions were held constant for a period of 2 days. At the beginning of the investigation, the quantity of CO_2 present in each closed container was 250 cubic centimeters. The data table shows the amount of CO_2 remaining in each container at the end of 2 days.

DATA TABLE

Container	Color of Light	CO_2 (cm^3)
1	BLUE	75
2	RED	50
3	GREEN	200
4	ORANGE	150

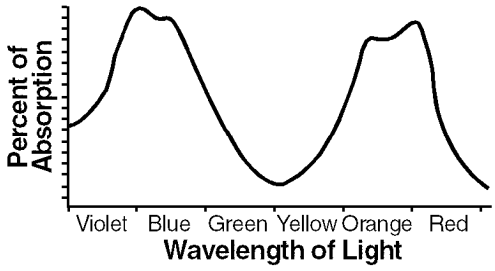
The variable in this investigation was the

1) color of light
2) number of days needed to complete the investigation
3) amount of CO_2 in each container at the beginning of the investigation
4) type of plant

31) A green plant is kept in a brightly lighted area for 48 hours. What will most likely occur if the light intensity is then reduced slightly during the next 48 hours?

1) Glucose production inside each plant cell will increase.
2) Photosynthesis will stop completely.
3) The rate at which oxygen is released from the plant will decrease.
4) The rate at which nitrogen is used by the plant will increase.

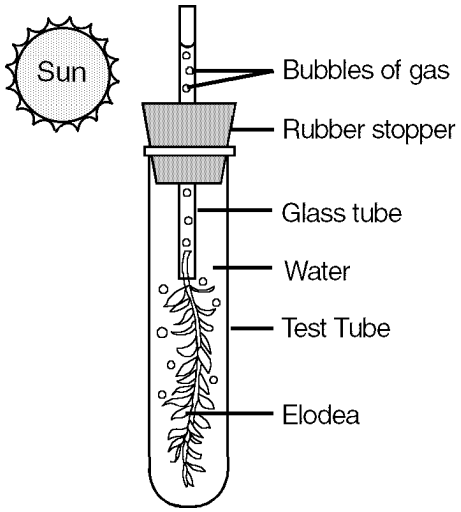
32) The graph below represents the absorption spectrum of chlorophyll.



The graph indicates that the energy used in photosynthesis is most likely obtained from which regions of the spectrum?

1) green and yellow
2) orange red and violet blue
3) violet blue and green
4) yellow and orange red

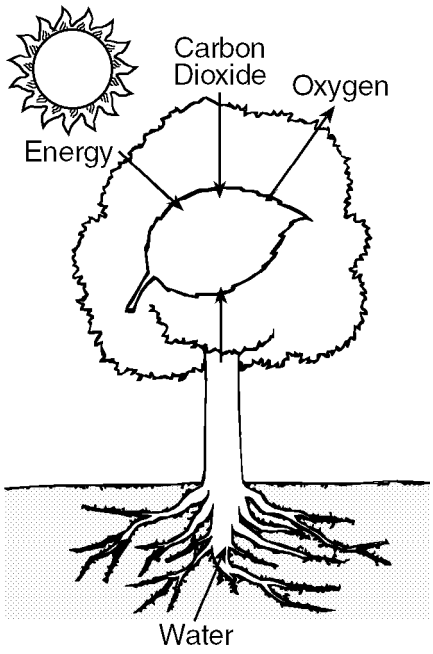
33) The diagram below shows an investigation performed over a period of 6 hours.



After the light source is changed from sunlight to pure green light, the rate of bubble production would most likely

1) decrease, only
2) increase, only
3) remain the same
4) increase, then decrease

34) Some activities that take place in a plant are represented in the diagram below.



The arrows in the diagram are associated with a process that directly involves the use of

1) cilia, stamens, and cambium
2) mitochondria, lenticels, and pistils
3) chloroplasts, stomates, and xylem
4) anthers, phloem, and vacuoles

35) Which organism can convert light energy into chemical energy?

1) mushroom
2) hydra
3) paramecium
4) alga