2015 Honors Biology Test Review Ch. 7 & 8

Modified True/False
Indicate whether the sentence or statement is true or false. If false, change the identified word or phrase to make the sentence or statement true.

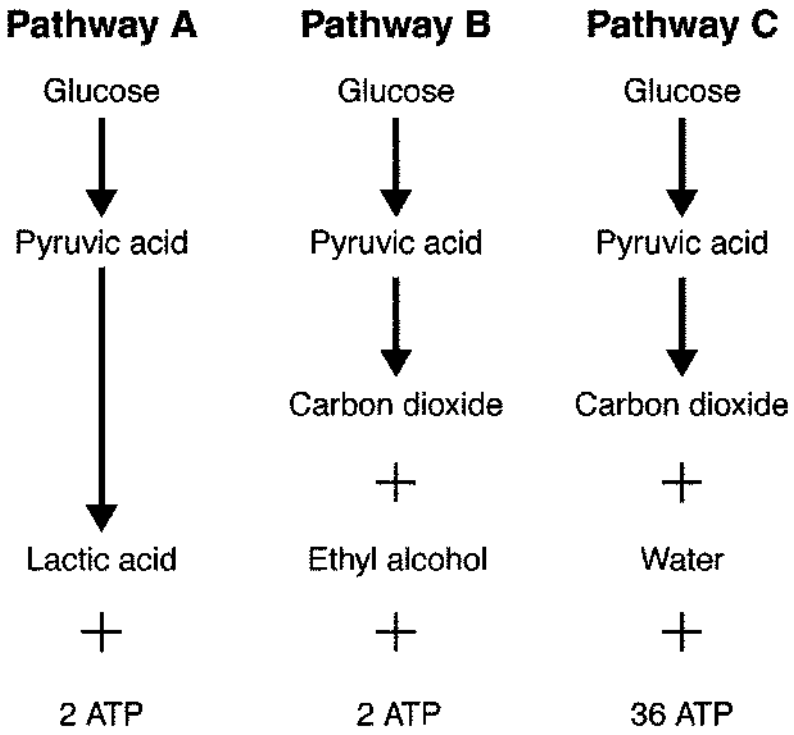


Figure 9-1

____ 1. The pathway labeled A in Figure 9-1 is called glycolysis. _____

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

____ 2. Which of the following is an autotroph?
a. mushroom
b. impala
c. leopard
d. tree

____ 3. A student is collecting the gas given off from a plant in bright sunlight at a temperature of 27°C. The gas being collected is probably
a. oxygen.
b. carbon dioxide.
c. ATP.
d. vaporized water.

____ 4. Photosynthesis uses sunlight to convert water and carbon dioxide into
a. oxygen.

b. high-energy sugars.
c. ATP and oxygen.
d. oxygen and high-energy sugars.

____ 5. Which of the following are used in the overall reactions for photosynthesis?
a. carbon dioxide
b. water
c. light
d. all of the above

____ 6. In the overall equation for photosynthesis, six molecules of carbon dioxide result in six molecules of
a. glucose.
b. water.
c. oxygen.
d. ATP.

____ 7. Plants gather the sun's energy with light-absorbing molecules called
a. pigments.
b. thylakoids.
c. chloroplasts.
d. glucose.

____ 8. Most plants appear green because chlorophyll
a. does not absorb green light.
b. reflects violet light.
c. absorbs green light.
d. none of the above

____ 9. Where do the light-dependent reactions take place?
a. in the stroma
b. outside the chloroplasts
c. in the thylakoid membranes
d. only in chlorophyll molecules

____ 10. The Calvin cycle is another name for
a. light-independent reactions.
b. light-dependent reactions.
c. photosynthesis.
d. all of the above

____ 11. The Calvin cycle takes place in the
a. stroma.
b. photosystems.
c. thylakoid membranes.
d. chlorophyll molecules.

____ 12. What is a product of the Calvin cycle?
a. oxygen gas
b. ATP
c. high-energy sugar
d. carbon dioxide gas

____ 13. Which of the following is NOT a stage of cellular respiration?
a. fermentation
b. electron transport
c. glycolysis
d. Krebs cycle

____ 14. Which of the following is released during cellular respiration?

a. oxygen
b. air
c. energy
d. lactic acid

____ 15. Cellular respiration uses one molecule of glucose to produce
a. 2 ATP molecules.
b. 34 ATP molecules.
c. 36 ATP molecules.
d. 38 ATP molecules.

____ 16. Which of these is a product of cellular respiration?
a. oxygen
b. water
c. glucose
d. all of the above

____ 17. Which of these processes takes place in the cytoplasm of a cell?
a. glycolysis
b. electron transport
c. Krebs cycle
d. all of the above

____ 18. Glycolysis provides a cell with a net gain of
a. 2 ATP molecules.
b. 4 ATP molecules.
c. 18 ATP molecules.
d. 36 ATP molecules.

____ 19. Lactic acid fermentation occurs in
a. bread dough.
b. any environment containing oxygen.
c. muscle cells.
d. mitochondria.

____ 20. The two main types of fermentation are called
a. alcoholic and aerobic.
b. aerobic and anaerobic.
c. alcoholic and lactic acid.
d. lactic acid and anaerobic.

____ 21. In the presence of oxygen, glycolysis is followed by
a. lactic acid fermentation.
b. alcoholic fermentation.
c. photosynthesis.
d. the Krebs cycle.

____ 22. The starting molecule for the Krebs cycle is
a. glucose.
b. NADH.
c. pyruvic acid.
d. coenzyme A.

____ 23. In eukaryotes, electron transport occurs in the
a. mitochondria.
b. chloroplasts.
c. cell membrane.
d. cytoplasm.

____ 24. The energy of the electrons passing along the electron transport chain is used to make
a. lactic acid.
b. citric acid.
c. alcohol.
d. ATP.

____ 25. How are cellular respiration and photosynthesis almost opposite processes?
a. Photosynthesis releases energy, and cellular respiration stores energy.
b. Photosynthesis removes carbon dioxide from the atmosphere, and cellular respiration puts it back.
c. Photosynthesis removes oxygen from the atmosphere, and cellular respiration puts it back.
d. all of the above

____ 26. Which of the following types of organisms does aerobic cellular respiration?
a. autotrophs
b. heterotrophs
c. both autotrophs and heterotrophs
d. neither autotrophs nor heterotrophs

____ 27. The products of photosynthesis are the
a. products of cellular respiration
b. reactants of cellular respiration
c. products of glycolysis
d. reactants of fermentation

____ 28. Organisms that cannot make their own food and must obtain energy from the foods they eat are called
a. autotrophs.
b. heterotrophs.
c. thylakoids.
d. plants.

____ 29. Which of the following is false?
a. A chloroplast contains stroma.
b. A stroma contains a thylakoid.
c. A granum contains several thylakoids.
d. A thylakoid contains chlorophyll.

____ 30. What are the products of the light-dependent reactions?
a. oxygen gas
b. ATP
c. NADPH
d. all of the above

____ 31. Which of the following is NOT a step in the light-dependent reactions?
a. High-energy electrons move through the electron transport chain.
b. Pigments in photosystem II absorb light.
c. ATP synthase allows H^+ ions to pass through the thylakoid membrane.
d. ATP and NADPH are used to produce high-energy sugars.

____ 32. Which pathway represents the flow of electrons during photosynthesis?
a. $H_2O \rightarrow$ Photosystem I $\rightarrow$ Photosystem II
b. $O_2 \rightarrow$ ADP $\rightarrow$ Calvin cycle
c. Photosystem I $\rightarrow$ Calvin cycle $\rightarrow$ NADPH
d. $H_2O \rightarrow$ NADPH $\rightarrow$ Calvin cycle

____ 33. If carbon dioxide is removed from a plant's environment, what would you expect to happen to the plant's production of high-energy sugars?
a. More sugars will be produced.
b. Fewer sugars will be produced.
c. The same number of sugars will be produced but without carbon dioxide.
d. Carbon dioxide does not affect the production of high-energy sugars in plants.

____ 34. Which of the following is the correct sequence of events in cellular respiration?

a. glycolysis → fermentation → Krebs cycle
b. Krebs cycle → electron transport → glycolysis
c. glycolysis → Krebs cycle → electron transport
d. Krebs cycle → glycolysis → electron transport

____ 35. What is the correct equation for cellular respiration?
a. $6O_2 + C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O + Energy$
b. $6O_2 + C_6H_{12}O_6 + Energy \rightarrow 6CO_2 + 6H_2O$
c. $6CO_2 + 6H_2O \rightarrow 6O_2 + C_6H_{12}O_6 + Energy$
d. $6CO_2 + 6H_2O + Energy \rightarrow 6O_2 + C_6H_{12}O_6$

____ 36. What are the reactants in the equation for cellular respiration?
a. oxygen and lactic acid
b. carbon dioxide and water
c. glucose and oxygen
d. water and glucose

____ 37. The starting molecule for glycolysis is
a. ADP.
b. pyruvic acid.
c. citric acid.
d. glucose.

____ 38. Which of the following is NOT a product of glycolysis?
a. NADH
b. pyruvic acid
c. ATP
d. glucose

____ 39. Which of the following acts as an electron carrier in cellular respiration?
a. NAD^+
b. pyruvic acid
c. ADP
d. ATP

____ 40. One cause of muscle soreness is
a. alcoholic fermentation.
b. glycolysis.
c. lactic acid fermentation.
d. the Krebs cycle.

____ 41. The conversion of pyruvic acid into lactic acid requires
a. alcohol.
b. oxygen.
c. ATP.
d. NADH.

____ 42. The Krebs cycle starts with
a. lactic acid and yields carbon dioxide.
b. glucose and yields 32 ATPs.
c. pyruvic acid and yields lactic acid or alcohol.
d. pyruvic acid and yields carbon dioxide.

____ 43. The electron transport chain can be found in
a. prokaryotes.
b. animals.
c. plants.
d. all of the above

____ 44. Which of the following passes high-energy electrons into the electron transport chain?
a. NADH and $FADH_2$
b. ATP and ADP
c. citric acid
d. acetyl – CoA

____ 45. Breathing heavily after running a race is your body's way of
a. making more citric acid.
b. repaying an oxygen debt.
c. restarting glycolysis.
d. recharging the electron transport chain.

____ 46. Which process does NOT release energy from glucose?
a. glycolysis
b. photosynthesis
c. fermentation
d. cellular respiration

____ 47. Photosynthesis is to chloroplasts as cellular respiration is to
a. chloroplasts.
b. cytoplasm.
c. mitochondria.
d. nuclei.

____ 48. The products of photosynthesis are the
a. products of cellular respiration.
b. reactants of cellular respiration.
c. products of glycolysis.
d. reactants of fermentation.

Completion
Complete each sentence or statement.

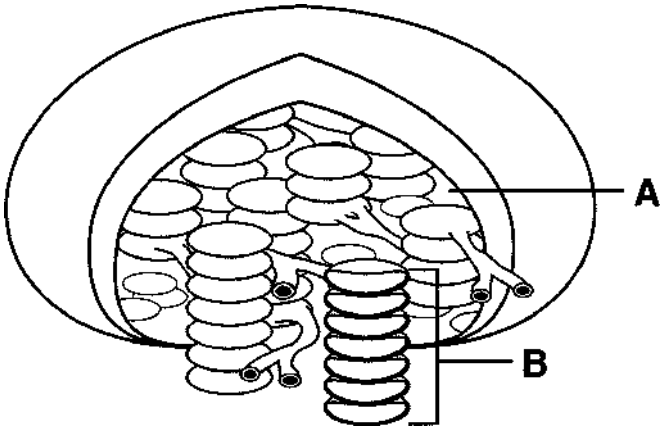


Figure 8-3

49. The area in Figure 8-3 labeled A is called _____.
a. stroma b. granac. thylakoid d. chlorophyll

35. The area in Figure 8-3 labeled B contains:

a. water b. nitrogen c. iron d. chlorophyll

50. Photosystems I and II are found in the structure labeled _____ in Figure 8-3.
51. Cells keep only a small amount of _____ on hand and regenerate it as needed by using carbohydrates.
52. In many plants, the rate of photosynthesis _____ when the weather becomes very cold.

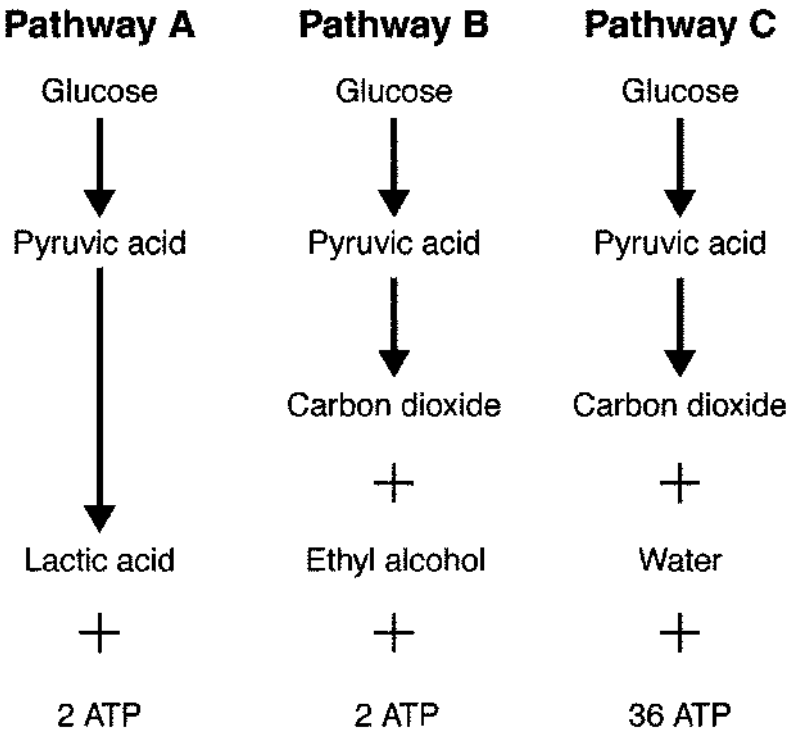


Figure 9-1

53. The pathway labeled B in Figure 9-1 is called _____ fermentation.
54. Based on Figure 9-1, _____ ATP molecules are formed by fermentation.
55. In Figure 9-1, only the pathway labeled _____ requires oxygen.
56. A person who regularly does aerobic exercise takes in _____ oxygen than a sedentary person.

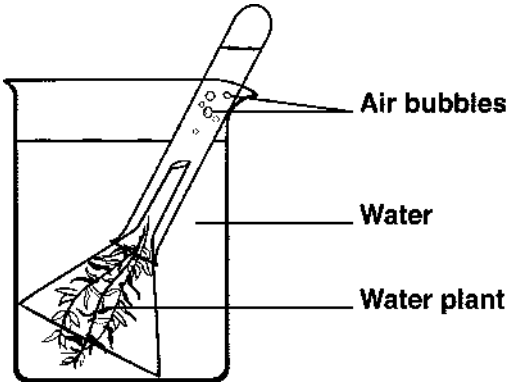
Short Answer

57. Cellular respiration is able to extract about 38 percent of the potential energy from glucose. What happens to the rest of the energy? Give an example.

Other

USING SCIENCE SKILLS

A student prepared two beakers with identical sprigs of a water plant as shown below. She placed one beaker in the shade and the other beaker beside a fluorescent lamp. She then systematically changed the distance of the beaker from the lamp. She counted the bubbles given off by each sprig of the water plant. Shown here is the graph of the data for the beaker she placed in the light.



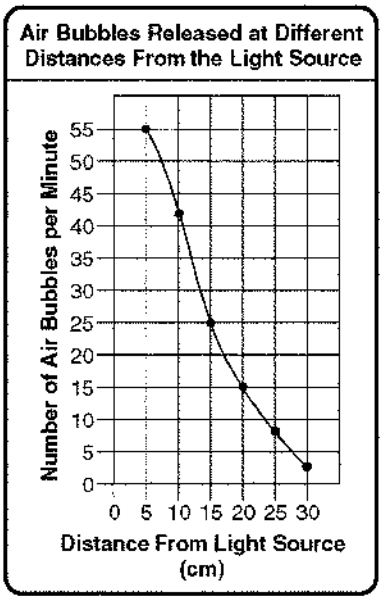


Figure 8-4

58. **Controlling Variables** Which beaker is the student's control?

59. **Applying Concepts** Look at Figure 8-4. If the student later tested the air bubbles collected in the test tube, what would she find they are made of? How do you know?

60. **Using Tables and Graphs** Look at the graph in Figure 8-4. At what distance from the light source was the greatest number of bubbles produced?

61. **Analyzing Data** Look at the graph in Figure 8-4. What do the student's data show?

62. **Predicting** If the lamp were placed closer than 5 centimeters from the water plant, would the plant give off many more bubbles? Why or why not?

USING SCIENCE SKILLS

A scientist set up a respiration chamber as shown below. She placed a mouse in flask B. Into flasks A, C, and D, she poured distilled water mixed with the acid-base indicator phenolphthalein. In the presence of CO_2, phenolphthalein turns from pink to clear. She allowed the mouse to stay in the chamber for about an hour.

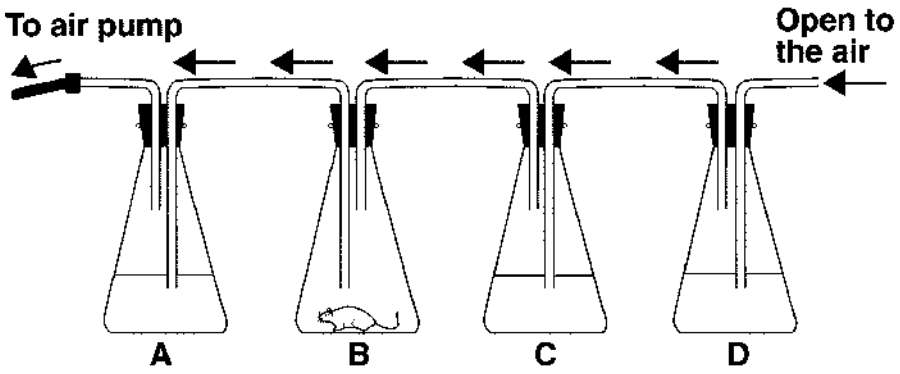


Figure 9-2

63. **Interpreting Graphics** What will the mouse require to carry out cellular respiration? Look at the flasks in Figure 9-2. Describe the flow of materials through the flasks. Will the mouse receive fresh air so that it can survive?

64. **Interpreting Graphics** Based on Figure 9-2, how will the scientist be able to detect whether the mouse is carrying out cellular respiration?

65. **Applying Concepts** Assume that the scientist set up an identical respiration chamber, except that in this setup she placed a cricket in flask B instead of a mouse. At the end of one hour, she measured the amount of CO_2 given off by the cricket and the mouse. A small amount of CO_2 had been given off by the mouse, but little to no CO_2 had been given off by the cricket. Was the cricket undergoing cellular respiration? Explain these results.

66. **Predicting** Assume that the scientist set up an identical respiration chamber, except that in this setup she placed a mouse that had been exercising on a hamster wheel. Then, the scientist measured the amount of CO_2 given off by both mice at the end of 15 minutes. Predict which setup produced the most CO_2. Explain your answer.

Honors Biology Test Review Ch. 7 & 8 Fall 2013
Answer Section

MODIFIED TRUE/FALSE

1. F, lactic acid fermentation

MULTIPLE CHOICE

2. D
3. A
4. D
5. D
6. C
7. A
8. A
9. C
10. A
11. A
12. C
13. A
14. C
15. C
16. B
17. A
18. A
19. C
20. C
21. D
22. C
23. A
24. D
25. B
26. C
27. B
28. B
29. B
30. D
31. D
32. D
33. B
34. C
35. A
36. C
37. D
38. D

39. A
40. C
41. D
42. D
43. D
44. A
45. B
46. B
47. C
48. B

COMPLETION

49. a.
    35. d
50. B
51. ATP
52. decreases
53. alcoholic
54. 2
55. C
56. more

SHORT ANSWER

57. The rest of the energy is released as heat, as indicated by the fact that you feel warmer after exercising and are able to maintain a constant temperature even in cold weather.

OTHER

58. The beaker she placed in the shade is the control.
59. The air bubbles are probably oxygen gas. Jan Ingenhousz showed that plants produce oxygen bubbles in the light but not in the dark.
60. 5 cm
61. The student's data show that as the light gets closer to the water plant, the water plant gives off more bubbles.
62. Probably not; the graph shows that the effect is leveling off. Also, we know that light intensity increases the rate of photosynthesis up to a certain point and then levels off.
63. Sample answer: The mouse requires oxygen. Fresh air containing oxygen flows from outside the flasks into flasks B, C, and D. Air mixed with whatever the mouse gives off flows from flask B into flask A. The mouse receives fresh air and should be able to survive in the chamber for the duration of the experiment.
64. Sample answer: If the mouse is carrying out cellular respiration, it will give off CO_2, the CO_2 will flow into flask A, and the phenolphthalein in flask A will change from pink to clear.

65. Sample answer: The cricket, like all living organisms, is carrying out cellular respiration. However, the mouse is larger than the cricket and gives off more CO_2 than the cricket. After one hour, the cricket probably has not given off enough CO_2 to measure. If the scientist allows the experiment to continue for several hours, she will see that more CO_2 is given off by the cricket over time.
66. Sample answer: The mouse that had been exercising should give off more CO_2 because this mouse will be breathing more heavily. This mouse might even have an oxygen debt to repay.