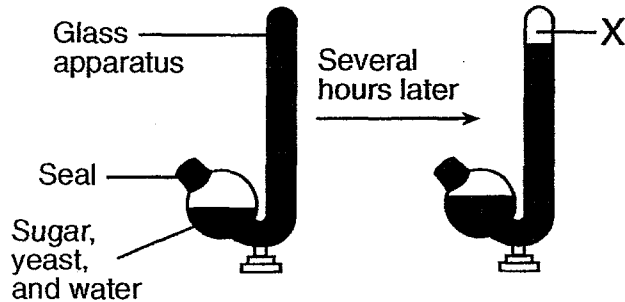


## Cell Respiration / Human Respiration

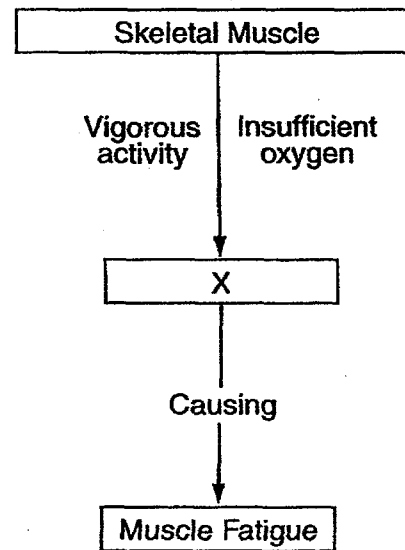
1. An investigation was carried out and the results are shown below. Substance *X* resulted from a metabolic process that produces ATP in yeast (a single-celled fungus).



Which statement best describes substance *X*?

- (1) It is oxygen released by protein synthesis.
  - (2) It is glucose that was produced in photosynthesis.
  - (3) It is starch that was produced during digestion.
  - (4) It is carbon dioxide released by respiration.
2. One type of anaerobic respiration results in the production of
- (1) water and oxygen
  - (2) pyruvic acid and glycerol
  - (3) nitrogen gas and ammonia
  - (4) alcohol and carbon dioxide
3. Bacteria that can survive without oxygen are described as
- (1) aerobic
  - (2) anaerobic
  - (3) heterotrophic
  - (4) saprophytic
4. Which part of a molecule provides energy for life processes?
- (1) carbon atoms
  - (2) oxygen atoms
  - (3) chemical bonds
  - (4) inorganic nitrogen

5. The diagram below shows a sequence of events that often occurs in human muscle cells.

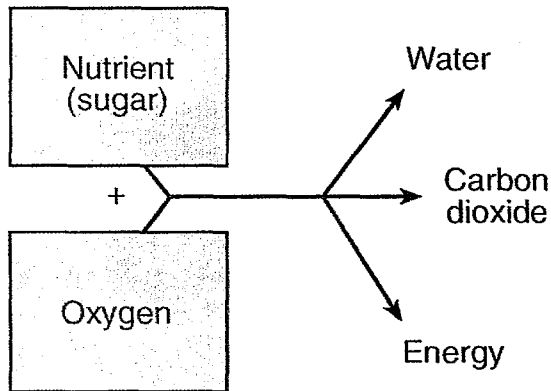


The substance represented by letter *X* is most likely

- (1) hemoglobin
  - (2) glycogen
  - (3) ethyl alcohol
  - (4) lactic acid
6. The rate at which all organisms obtain, transform, and transport materials depends on an immediate supply of
- (1) ATP and enzymes
  - (2) solar energy and carbon dioxide
  - (3) carbon dioxide and enzymes
  - (4) ATP and solar energy
7. Energy from organic molecules can be stored in ATP molecules as a direct result of the process of
- (1) cellular respiration
  - (2) cellular reproduction
  - (3) diffusion
  - (4) digestion

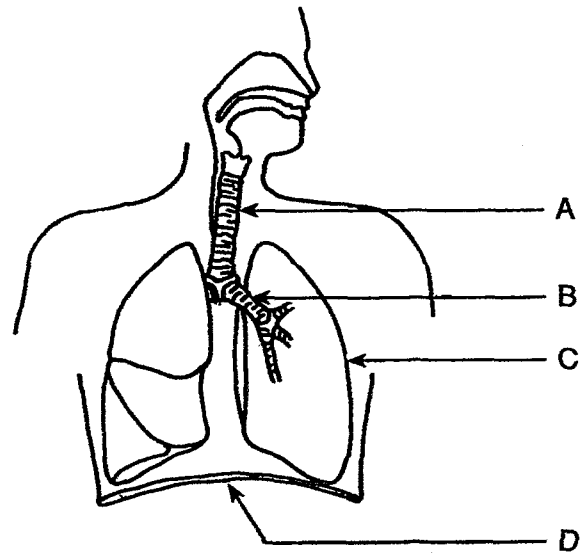


Base your answers to questions 15 and 16 on the diagram below. The diagram illustrates a process by which energy is released in organisms.



15. The energy released in this process was originally present in
- (1) sunlight and then transferred to sugar
  - (2) sunlight and then transferred to oxygen
  - (3) the oxygen and then transferred to sugar
  - (4) the sugar and then transferred to oxygen
16. Cells usually transfer the energy that is released directly to
- |             |             |
|-------------|-------------|
| (1) glucose | (3) oxygen  |
| (2) ATP     | (4) enzymes |
- 
17. Which sequence correctly indicates the branching pattern of the human respiratory system?
- (1) trachea → bronchi → bronchioles → alveoli
  - (2) trachea → bronchioles → bronchi → alveoli
  - (3) alveoli → trachea → bronchioles → bronchi
  - (4) alveoli → bronchioles → trachea → bronchi

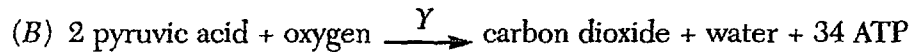
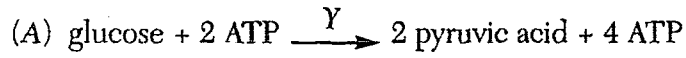
18. Which structure shown in the diagram below contracts, causing a pressure change in the chest cavity during breathing?



- |       |       |
|-------|-------|
| (1) A | (3) C |
| (2) B | (4) D |
19. An increase in breathing rate can be triggered by an increase in the
- (1) carbon dioxide content of the blood
  - (2) oxygen content of the atmosphere
  - (3) number of platelets in the blood
  - (4) number of red blood cells
20. Which part of the human respiratory system is a thin, moist membranous structure where gas exchange occurs?
- |              |                |
|--------------|----------------|
| (1) trachea  | (3) epiglottis |
| (2) bronchus | (4) alveolus   |
21. In the human respiratory system, bronchioles directly connect the
- (1) trachea and pharynx
  - (2) bronchi and alveoli
  - (3) nasal cavity and trachea
  - (4) epiglottis and larynx

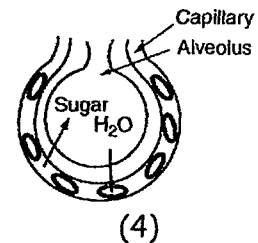
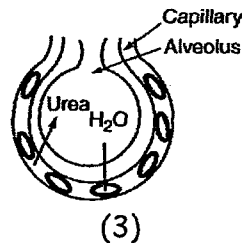
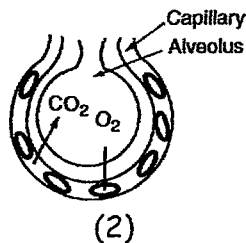
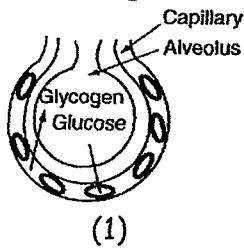
Base your answers to questions 22 through 24 on the equations shown below.

*Equations*



22. What is the combined net gain of ATP molecules at the completion of reactions *A* and *B*?  
(1) 36                      (2) 2                      (3) 34                      (4) 4
23. What does letter *Y* represent?  
(1) enzymes                      (3) light and chlorophyll  
(2) hemoglobin                      (4) water and minerals
24. In animals, the reaction in equation *B* occurs in the  
(1) lysosomes                      (2) chloroplasts                      (3) mitochondria                      (4) ribosomes

25. Which diagram best illustrates the function of an alveolus?



26. Humans breathe more rapidly during exercise than before it because during exercise the blood contains  
(1) an increased level of oxygen  
(2) a decreased number of red blood cells  
(3) an increased level of carbon dioxide  
(4) a decreased amount of hemoglobin
27. In humans, most gas exchange occurs between the  
(1) excretory tubules and body cells  
(2) arteries and body cells  
(3) skin and air  
(4) alveoli and capillaries

28. Which set of symptoms would most likely lead to a diagnosis of asthma?  
(1) enlargement and degeneration of the alveoli  
(2) constriction of the bronchial tubes and wheezing  
(3) inflammation and swelling of the epiglottis  
(4) constriction of the nasal cavity and watery eyes

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29. An allergic reaction characterized by the constriction of the bronchial tubes is known as

- (1) coronary thrombosis
- (2) arthritis
- (3) asthma
- (4) emphysema

30. Which malfunction of the human body is characterized by an enlargement and degeneration of the alveoli, resulting in a decreased lung capacity?

- (1) cerebral palsy
- (2) coronary thrombosis
- (3) emphysema
- (4) leukemia

31. What will most likely happen when food is in the trachea?

- (1) The food will interfere with the passage of air to the alveoli.
  - (2) The food will undergo emulsification and deamination.
  - (3) The food will be moved down to the stomach by peristalsis.
  - (4) The food will be completely digested as a result of enzyme action.
-

Cell Respiration / Human Respiration

32. In humans, the small chambers of the lungs involved in the exchange of gases are the

- (1.) atria
- (2.) alveoli
- (3.) tracheal tubes
- (4.) bronchi

33. Among humans, an increase in the rate of respiration and heartbeat results when the blood contains

- (1.) too little glucose
- (2.) too little oxygen
- (3.) too much carbon dioxide
- (4.) too much nitrogenous waste

34. The rate of breathing in humans is controlled mainly by the

- (1.) medulla
- (2.) cerebellum
- (3.) cerebrum
- (4.) spinal cord

35. A disease involving the breakdown of the air sacs in the lungs is

- (1.) arteriosclerosis
- (2.) coronary thrombosis
- (3.) asthma
- (4.) emphysema

36. When you hold your breath for half a minute, the carbon dioxide concentration in the blood

- (1.) increases
- (2.) decreases
- (3.) remains the same

37. Which process occurs during the exchange of gases at the air sacs?

- (1.) diffusion
- (2.) osmosis
- (3.) phagocytosis
- (4.) breathing

38. Which blood vessels surround all of the air sacs?

- (1.) arteries
- (2.) veins
- (3.) capillaries
- (4.) lymphatics

39. Which structures contains the vocal cords, whose vibration makes speech possible?

- (1.) larynx
- (2.) epiglottis
- (3.) trachea
- (4.) pharynx

40. Which structures connect the bronchi with the alveoli?

- (1.) air sacs
- (2.) tracheas
- (3.) bronchioles
- (4.) capillaries

41. Which (are) part of the nasal cavity's function(s)?

- (1.) filter incoming air
- (2.) warm incoming air
- (3.) moisten incoming air
- (4.) all of the above are functions of the nasal cavity

## Answer Key

1. 4

22. 1

2. 4

23. 1

3. 2

24. 3

4. 3

25. 2

5. 4

26. 3

6. 1

27. 4

7. 1

28. 2

8. 2

29. 3

9. 1

30. 3

10. 3

31. 1

11. 3

12. 4

13. 2

14. 4

15. 1

16. 2

17. 1

18. 4

19. 1

20. 4

21. 2

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