

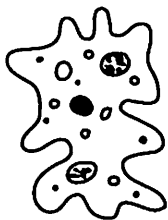
Name:

Topic Two:
The Cell, Organelles and Cell Membrane

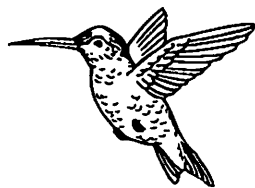
1. The life function of transport in an organism directly involves those activities used to
 - 1) absorb and distribute materials
 - 2) obtain and hydrolyze materials
 - 3) release energy from food
 - 4) produce cellular waste products
2. Which life process is classified as autotrophic in some organisms and heterotrophic in other organisms?
 - 1) hormonal regulation
 - 2) nutrition
 - 3) anaerobic respiration
 - 4) transport
3. Nutrition involves those activities by which organisms
 - 1) remove cellular waste products
 - 2) obtain and process materials needed for other activities
 - 3) exchange gases with their environment
 - 4) absorb and circulate materials
4. A hydra ingests a Daphnia, digests it, and later egests some materials. All of these events are most closely associated with the life process known as
 - 1) transport
 - 2) synthesis
 - 3) growth
 - 4) nutrition
5. Which life function is primarily involved in the conversion of the energy stored in organic molecules to a form directly usable by a cell?
 - 1) absorption
 - 2) circulation
 - 3) digestion
 - 4) respiration
6. Proteins not ingested by humans are found in human cells. The presence of these proteins is most directly a result of
 - 1) regulation
 - 2) synthesis
 - 3) respiration
 - 4) excretion
7. The function of a cell depends primarily on its
 - 1) life span
 - 2) color
 - 3) structure
 - 4) movement
8. An animal maintains its fluid balance by regulating the gain and loss of water. This maintenance is an example of
 - 1) homeostasis
 - 2) hydrolysis
 - 3) cyclosis
 - 4) peristalsis
9. If a human system fails to function properly, what is the most likely result?
 - 1) a stable rate of metabolism
 - 2) a disturbance in homeostasis
 - 3) a change in the method of cellular respiration
 - 4) a change in the function of DNA
10. The normal sodium level in human blood is 135 mEq/L. If a blood test taken immediately after a meal reveals a sodium level of 150 mEq/L, what will most likely result?
 - 1) Antibody production will increase.
 - 2) The person will move to an ecosystem with a lower sodium level.
 - 3) The nutritional relationships between humans and other organisms will change.
 - 4) An adjustment within the human body will be made to restore homeostasis.
11. What usually results when an organism fails to maintain homeostasis?
 - 1) Growth rates within organs become equal.
 - 2) The organism becomes ill or may die.
 - 3) A constant sugar supply for the cells is produced.
 - 4) The water balance in the tissues of the organism stabilizes.
12. As a result of their metabolic activities, many organisms produce harmful substances. These substances are eliminated by the process of
 - 1) ingestion
 - 2) secretion
 - 3) pinocytosis
 - 4) excretion
13. Which structures carry out life functions within cells?
 - 1) tissues
 - 2) organ systems
 - 3) organelles
 - 4) organs

14. Two organisms are represented below.

Single-celled
Organism A



Multicellular
Organism B



Which statement concerning organism A and organism B is correct?

- 1) Organism A contains tissues while organism B lacks tissues.
- 2) Organism A and organism B have the same organs.
- 3) Organism A and organism B have structures that allow them to maintain homeostasis.
- 4) Organism A lacks structures that maintain a dynamic equilibrium, while organism B has these structures.

15. Which organelle is correctly paired with its function?

- 1) nucleus — stores materials for the production of bigger proteins and lipids
- 2) chloroplast — serves as a site for photosynthesis
- 3) centriole — breaks down worn-out organelles
- 4) lysosome — sorts and packages cellular products

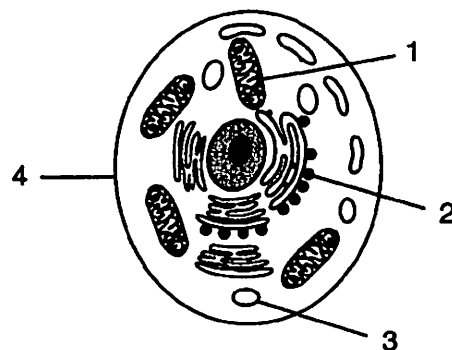
16. Which cell organelle is most directly involved with the creation of proteins.

- 1) mitochondrion
- 2) endoplasmic reticulum
- 3) cell wall
- 4) ribosome

17. Damage to which structure will most directly disrupt water balance within a single-celled organism?

- 1) ribosome
- 2) cell membrane
- 3) nucleus
- 4) chloroplast

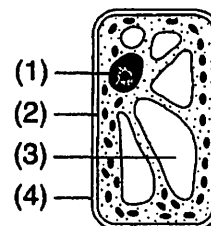
18.



Within which structure shown in the diagram below are energy-rich organic compounds used to produce ATP?

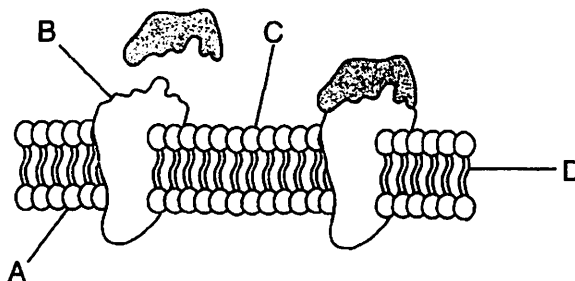
- 1) 1
- 2) 2
- 3) 3
- 4) 4

19. Which cell structure contains information needed for protein synthesis?



- 1) 1
- 2) 2
- 3) 3
- 4) 4

20. The diagram below represents a portion of a cell membrane.



Which structure may function in the recognition of chemical signals?

- 1) A
- 2) B
- 3) C
- 4) D

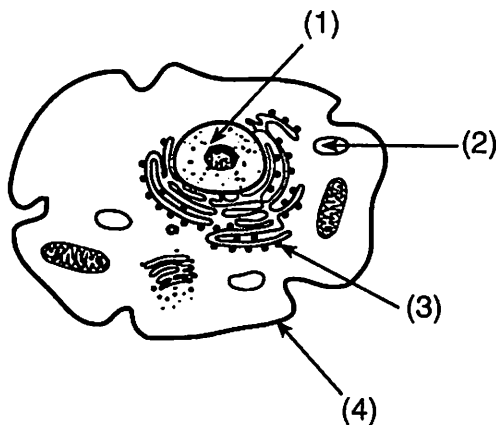
21. The data table below shows the presence or absence of DNA in four different cell organelles.

Data Table

Organelle	DNA
cell membrane	absent
cell wall	absent
mitochondrion	present
nucleus	present

Information in the table suggests that DNA functions

- 1) within cytoplasm and outside of the cell membrane
 - 2) both inside and outside of the nucleus
 - 3) only within energy-releasing structures
 - 4) within cell vacuoles
22. In the diagram below, which structure; performs a function similar to a function of the human lungs?

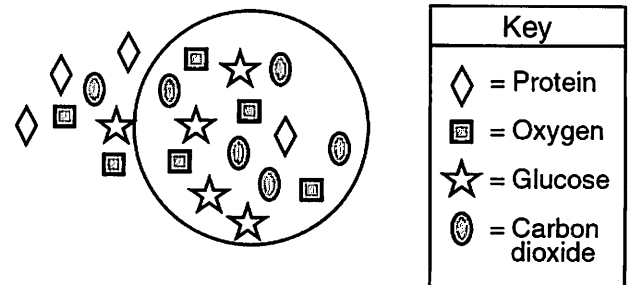


- | | |
|------|------|
| 1) 1 | 3) 3 |
| 2) 2 | 4) 4 |

23. Which statement regarding the functioning of the cell membrane of all organisms is *not* correct?

- 1) The cell membrane forms a boundary that separates the cellular contents from the outside environment.
- 2) The cell membrane is capable of receiving and recognizing chemical signals.
- 3) The cell membrane forms a barrier that keeps all substances that might harm the cell from entering the cell.
- 4) The cell membrane controls the movement of molecules into and out of the cell.

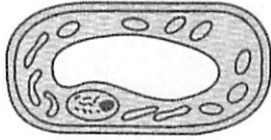
24. The diagram below shows the relative concentration of molecules inside and outside of a cell.



Which statement best describes the general direction of diffusion across the membrane of this cell?

- 1) Glucose would diffuse into the cell.
- 2) Protein would diffuse out of the cell.
- 3) Carbon dioxide would diffuse out of the cell.
- 4) Oxygen would diffuse into the cell.

25. The diagram below represents a plant cell in tap water as seen with a compound light microscope.

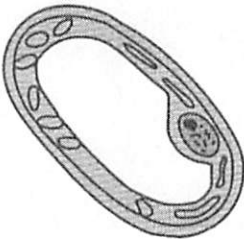


Which diagram best represents the appearance of the cell after it has been placed in a 15% salt solution for two minutes?

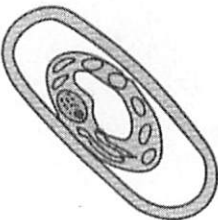
1)



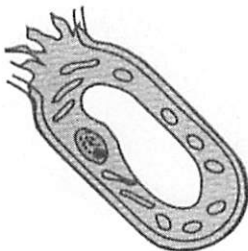
2)



3)



4)



26. Molecule X moves across a cell membrane by diffusion. Which row in the chart below best indicates the relationship between the relative concentrations of molecule X and the use of ATP for diffusion?

Row	Movement of Molecule X	Use of ATP
(1)	high concentration → low concentration	used
(2)	high concentration → low concentration	not used
(3)	low concentration → high concentration	used
(4)	low concentration → high concentration	not used

1) 1

3) 3

2) 2

4) 4

27. Which row in the chart below best describes the active transport of molecule X through a cell membrane?

Row	Movement of Molecule X	ATP
(1)	high concentration → low concentration	used
(2)	high concentration → low concentration	not used
(3)	low concentration → high concentration	used
(4)	low concentration → high concentration	not used

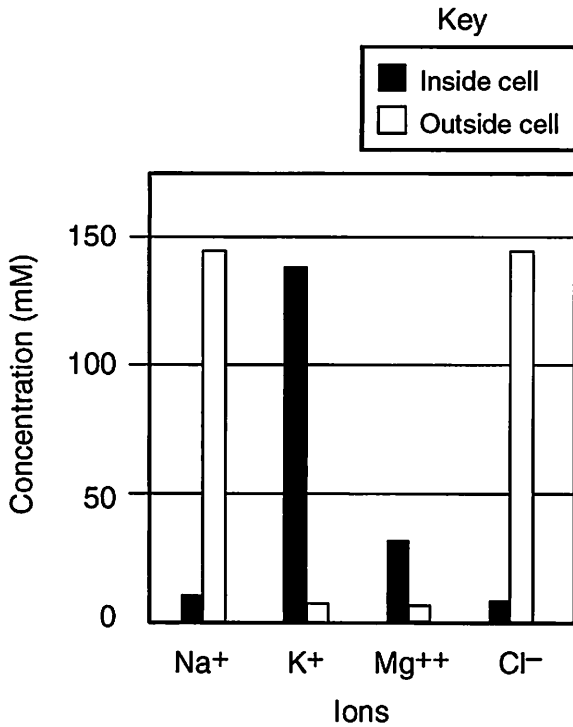
1) 1

3) 3

2) 2

4) 4

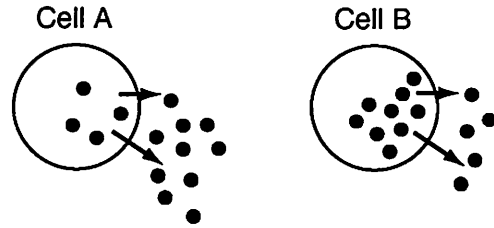
28. The graph below shows the relative concentrations of different ions inside and outside of an animal cell.



Which process is directly responsible for the net movement of K⁺ and Mg⁺⁺ into the animal cell?

- 1) electrophoresis
- 2) diffusion
- 3) active transport
- 4) circulation

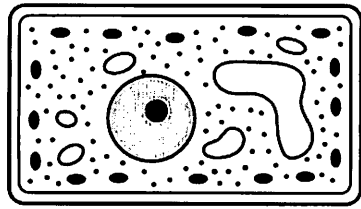
29. In the diagram below, the dark dots indicate small molecules. These molecules are moving out of the cells, as indicated by the arrows. The number of dots inside and outside of the two cells represents the relative concentrations of the molecules inside and outside of the cells.



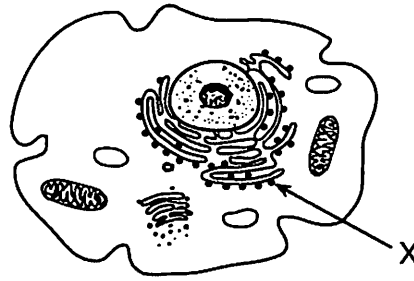
ATP is being used to move the molecules out of the cell by

- 1) cell A, only
- 2) cell B, only
- 3) both cell A and cell B
- 4) neither cell A nor cell B

Base your answers to questions 30 through 33 on the information below and on your knowledge of biology. The diagrams represent two different cells and some of their parts. The diagrams are not drawn to scale.



Cell A



Cell B

30. Which statement best describes these cells?

- 1) Cell *B* lacks vacuoles while cell *A* has them.
- 2) DNA would not be found in either cell *A* or cell *B*.
- 3) Both cell *A* and cell *B* use energy released from ATP.
- 4) Both cell *A* and cell *B* produce antibiotics.

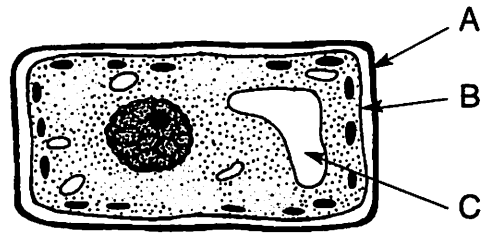
31. Name an organelle in cell *A* that is the site of photosynthesis (making food using the sun's energy).

32. Identify an organelle in cell *A* that is the site of autotrophic nutrition.

33. Identify the organelle labeled *X* in cell *B*.

34. Two life functions performed by all living organisms are nutrition and respiration. Identify two other life functions that are essential for the survival of all living organisms. Explain how each of the two life functions you identified maintains homeostasis.

35. A plant cell is represented in the diagram below.



Name each of the following structures.

A =

B =

C =

Explain the function of letter C. Write at least one complete sentence.