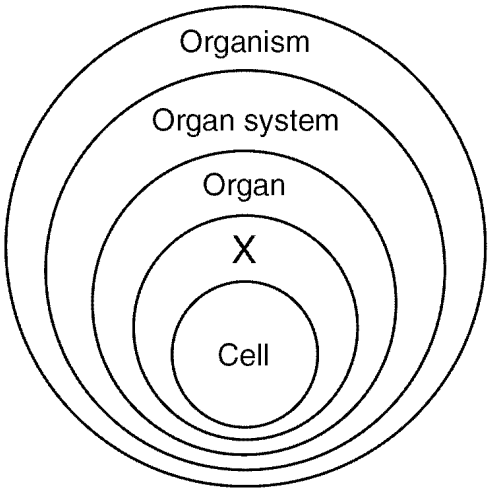
Cell Review

1. The diagram below represents levels of organization in living things.



Which term would best represent *X*?

1) human
2) tissue
3) stomach
4) chloroplast

2. Which statement is *not* a part of the cell theory?

1) Cells are the basic unit of structure of living things.
2) Cells are the basic unit of function of living things.
3) Cell parts such as chloroplasts are self-replicating.
4) Cells come from preexisting cells.

3. Which sequence of terms is in the correct order from simplest to most complex?

1) cells → tissues → organs → organ systems
2) tissues → organisms → cells → organ systems
3) cells → tissues → organ systems → organs
4) organs → organisms → organ systems → cells

4. Which instrument was used in the 18th and 19th centuries and helped scientists develop the cell theory?

1) electron microscope
2) light microscope
3) microdissecting apparatus
4) ultracentrifuge

5. The development of the cell theory was most directly related to the

1) improvement of the microscope and microscopic techniques
2) use of a five-kingdom classification system
3) development of the gene-chromosome theory
4) discovery of bacteria and viruses

6. Which structure is best observed using a compound light microscope?

1) a cell
2) a virus
3) a DNA sequence
4) the inner surface of a mitochondrion

7. Which sequence shows a *decreasing* level of complexity?

1) organs →organism →cells → tissues
2) organism → cells →organs → tissues
3) cells → tissues → organs → organism
4) organism →organs → tissues →cells

8. Which structures carry out life functions within cells?

1) tissues
2) organ systems
3) organelles
4) organs

9. What organelle releases energy for metabolic activity in cells?

1) chloroplast
2) ribosome
3) mitochondrion
4) vacuole

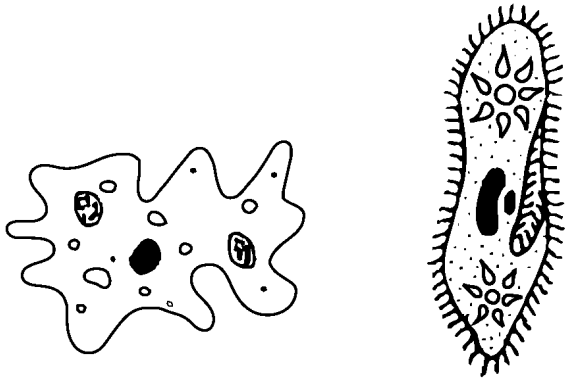
10. Which organelle is correctly paired with its specific function?

    1) cell membrane—storage of hereditary information
    2) chloroplast—transport of materials
    3) ribosome—synthesis of proteins
    4) vacuole—production of ATP

11. The largest amount of DNA in a plant cell is contained in

    1) a nucleus
    2) a chromosome
    3) a protein molecule
    4) an enzyme molecule

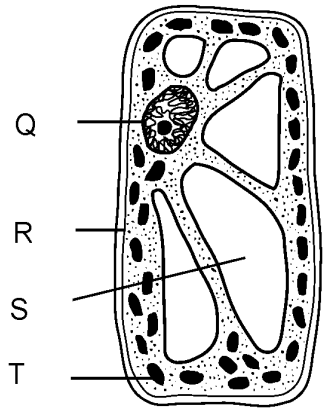
12. The diagram below represents two single-celled organisms.



    These organisms carry out the activities needed to maintain homeostasis by using specialized internal

    1) tissues **2) organelles**
    3) systems 4) organs

13. Which letter indicates a cell structure that directly controls the movement of molecules into and out of the cell?



    1) Q **2) *R*** 3) *S* 4) T

14. One difference between plant and animal cells is that animal cells do *not* have

    1) a nucleus **2) chloroplasts**
    3) a cell membrane 4) centrioles

15. Which organelle is correctly paired with its function?

    1) nucleus — provides carbohydrates for fermentation
    2) chloroplast — serves as a site for photosynthesis
    3) centriole — synthesizes digestive enzymes
    4) lysosome — packages cellular products

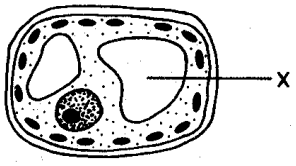
16. Which cell organelle is composed of a series of channels throughout the cytoplasm that functions in the transport of molecules?

    1) lysosome
    2) chloroplast
    3) cell wall
    4) endoplasmic reticulum

17. A structure involved in regulating the movement of materials into a cell is the

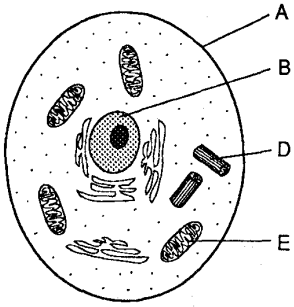
    1) ribosome 2) centriole
    3) Golgi complex **4) cell membrane**

___ 18. In the diagram of a cell below, the structure labeled *X* enables the cell to

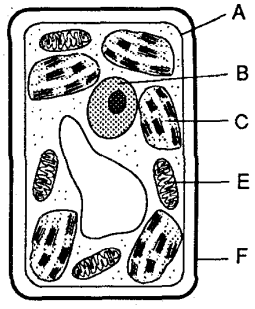


1) release energy
2) store waste products
3) control nuclear division
4) manufacture proteins

___ 19. Base your answer to the following question on the diagrams below which represent two different cells.



CELL I

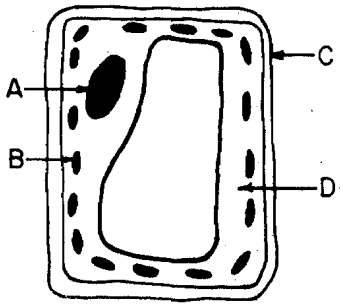


CELL II

Cell II most likely represents a plant cell due to the presence of

1) *A* 2) *B* 3) *E* **4) *F***

___ 20. Which structures in the diagram below enable the observer to identify it as a plant cell?



1) *A* and *B* **2) *B* and *C***
3) *A* and *C* 4) *B* and *D*

21. Write the structures listed below in order from least complex to most complex.

organ
cell
organism
organelle
tissue

Least complex: _____

_____

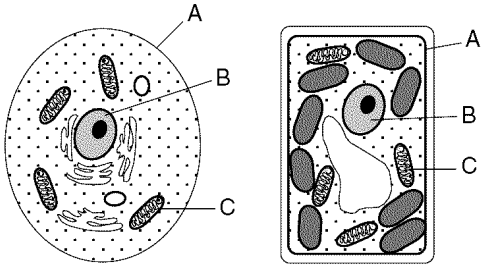
_____

_____

_____

Most complex: _____

Base your answers to questions **22** through **24** on the diagrams below of two cells, *X* and *Y,* and on your knowledge of biology.



Cell X

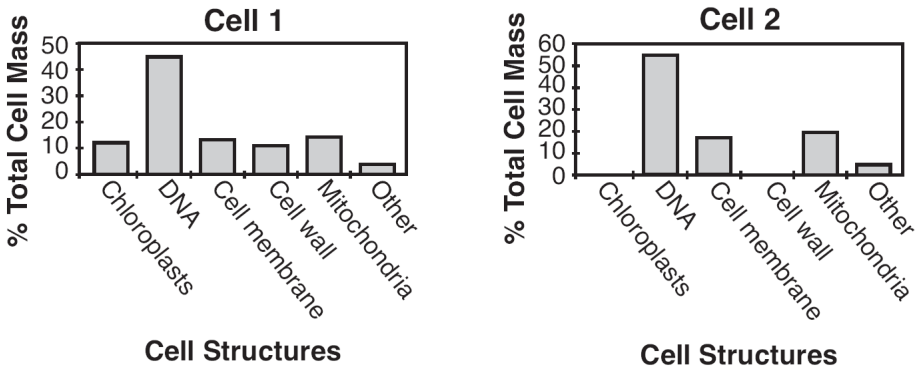
Cell Y

22. Select one lettered organelle and write the letter of that organelle in the space below. Identify the organelle you selected.

23. State one function of the organelle that you identified in the previous question.

24. Identify one process that is carried out in cell Y that is not carried out in Cell X

___ 25. Data from two different cells are shown in the graphs below.



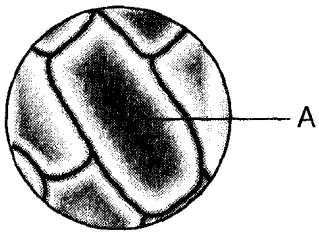
Which cell is most likely a plant cell? Support your answer.

___ 26. Describe what will happen to red onion cells in a wet-mount slide when a saltwater solution is added to them.

___ 28. State *one* reason why some molecules can pass through a certain membrane, but other molecules can *not*.

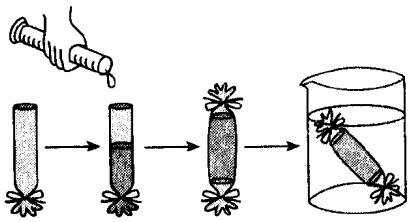
___ 27. Base your answer to the following question on the information and diagram below and on your knowledge of biology.

A wet mount of red onion cells as seen with a compound light microscope is shown below.

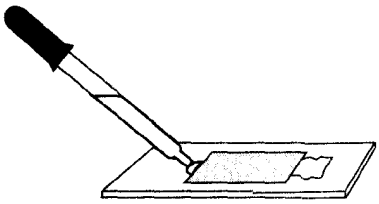


Which diagram best illustrates the technique that would most likely be used to add salt to these cells?

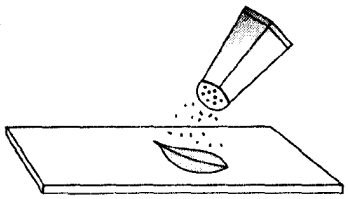
1)



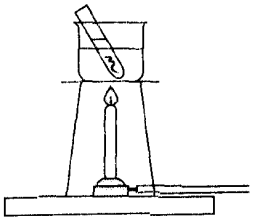
2)



3)

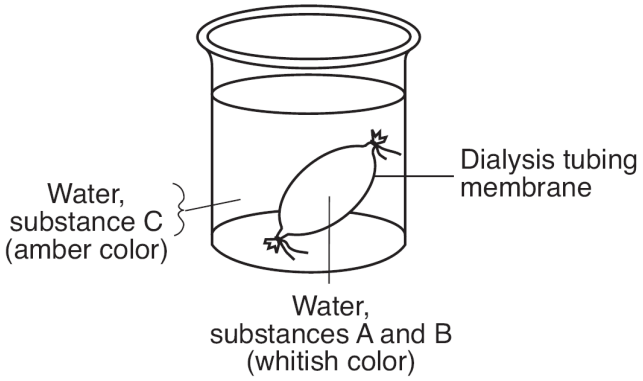


4)



____ 29. Base your answer to the following question on the following experiment.

A model of a cell is prepared and placed in a beaker of fluid as shown in the diagram below. The letters *A*, *B*, and *C* represent substances in the initial experimental setup.



The table below summarizes the content and appearance of the cell model and beaker after 20 minutes.

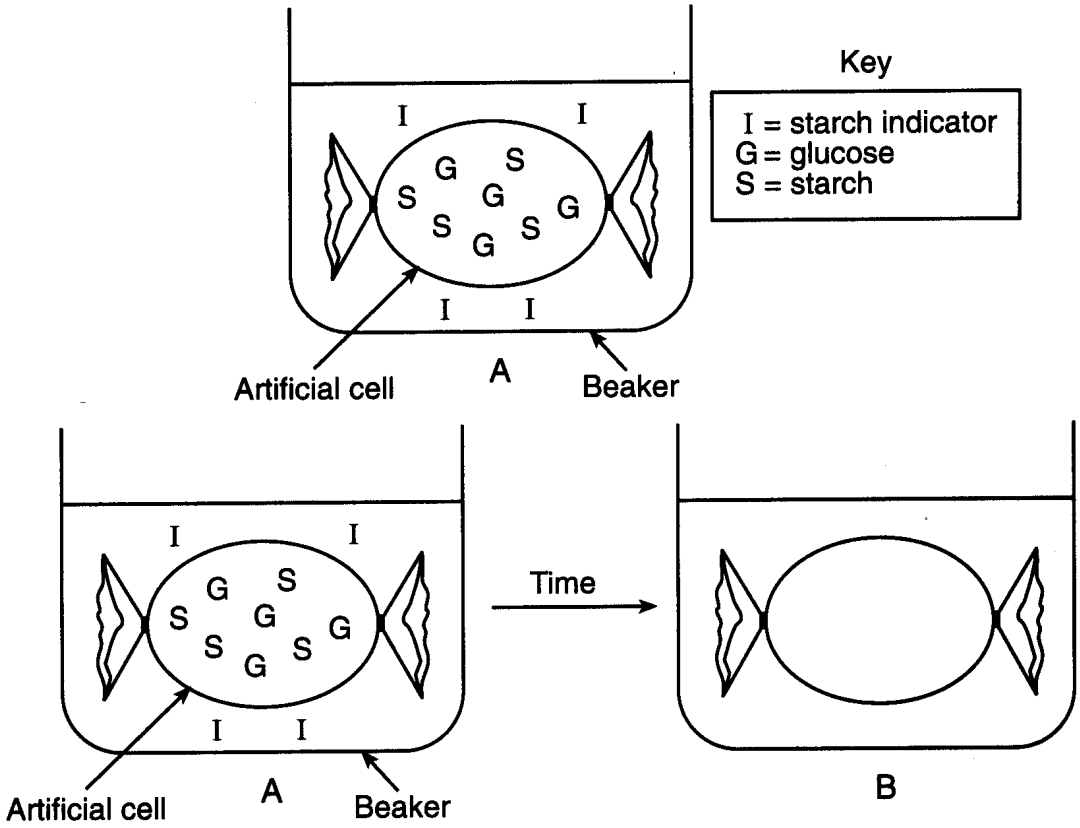
Results After 20 Minutes

	Outside of Cell Model	Inside of Cell Model
Substances	water, A, C	water, A, B, C
Color	amber	blue black

Complete the table below to summarize a change in location of substance *C* in the experimental setup.

Name of Substance C	Direction of Movement of Substance C	Reason for the Movement of Substance C

____ 30. Base your answer to the following question on the information and diagram below and on your knowledge of biology. The diagram illustrates an investigation carried out in a laboratory activity on diffusion. The beaker and the artificial cell also contain water.



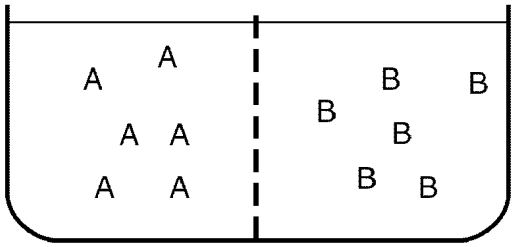
State what is observed when there is a positive test for starch using the starch indicator.

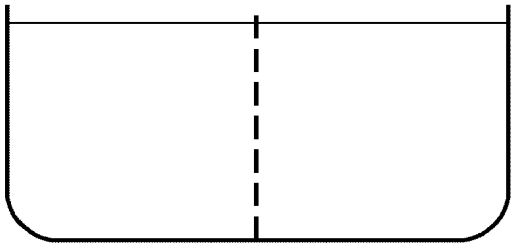
____ 31. A red onion cell has undergone a change, as represented in the diagram below.

This change is most likely due to the cell being placed in

1) distilled water 2) light
3) salt water 4) darkness

32. The diagram below represents a container of water and two different kinds of molecules, *A* and *B*, separated into two chambers by a membrane through which only water and molecule *A* can pass.

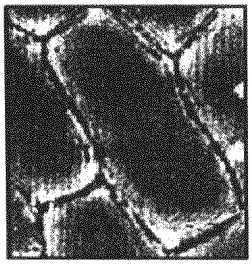
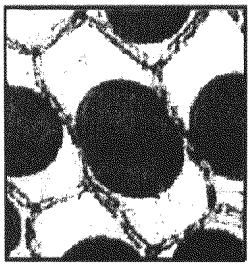


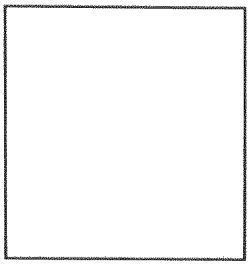


On the diagram of the container above, indicate the distribution of molecules *A* and *B* after the net movement of these molecules stops.

Base your answers to questions **33** and **34** on on the information and diagram below.

A student prepared a wet-mount slide of red onion skin and observed it under high power of a compound light microscope (view A). After adding a substance to the slide and waiting one minute, the student observed that there were changes in the cells (view *B).*

View A	View B
	

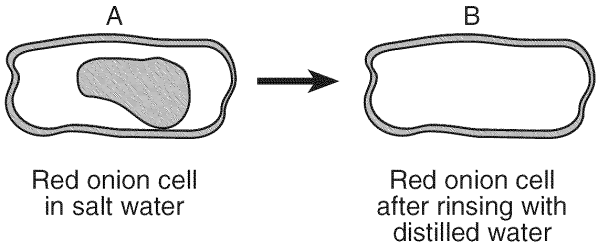


___ 33. Identify the specific substance that diffused to cause the change in appearance from view A to view *B.*

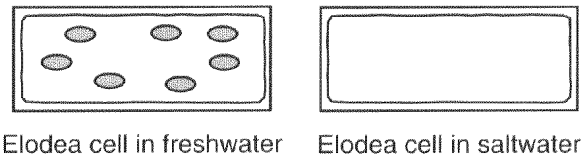
___ 34. In the box above, sketch how view *B* would appear when viewed under lower power of the same compound light microscope.

35. A student prepared a wet-mount slide of some red onion cells and then added some salt water to the slide. The student observed the slide using a compound light microscope. Diagram *A* is typical of what the student observed after adding salt water.

Complete diagram *B* to show how the contents of the red onion cells should appear if the cell were then rinsed with distilled water for several minutes.



36. *Elodea* is a plant that lives in freshwater. The diagram below represents one *Elodea* leaf cell in its normal freshwater environment.

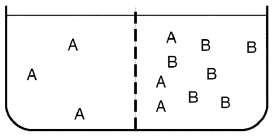


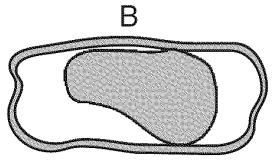
Predict how the contents of the *Elodea* cell would change if the cell was placed in saltwater for several minutes by completing the diagram, *"Elodea* cell in saltwater" above. Label the location of the cell membrane.

Answer Key
Cell Test

1. **2**
2. **3**
3. **1**
4. **2**
5. **1**
6. **1**
7. **4**
8. **3**
9. **3**
10. **3**
11. **1**
12. **2**
13. **2**
14. **2**
15. **2**
16. **4**
17. **4**
18. **2**
19. **4**
20. **2**
21. organelle
    cell
    tissue
    organ
    organism
22. *Examples*: — *A* (cell membrane) regulates what enters and leaves the cell. — *B* (nucleus) controls cell activities or contains the genetic codes. (Do *not* accept "bra- in" or "control center" without further explanation.) — *C* (mitochondrion) respiration or energy release or production of ATP (Do *not* accept "power house" without further explanation.)
23. *Examples:* — photosynthesis — production of cellulose — produces chlorophyll — producing its own food
24. *Examples: A* — cell/plasma membrane *or B* — nucleus *or C* — mitochondrion.
25. *Example:* - Cell 1, because it contains chloroplasts. - Cell 1, because it has a cell wall.
26. — Water will move out of the cell (diffuse). — The cell contents will shrink.
27. **2**
28. *Examples:* – Some molecules are too large to pass through the membrane – Some molecules are not soluble – the permeability of the membrane
29.

Name of Substance C	Direction of Movement of Substance C	Reason for the Movement of Substance C
— starch indicator — iodine	— into model cell — from high to low concentration	— small size of molecules — differences in concentration — diffusion

30. Acceptable responses include, but are not limited to: a color change or that the color changes from amber to blue black.
31. **3**
32. 

33. Water
34. In the box show more cells than in the original view, each smaller in size, with shrunken contents.
35. 

36.