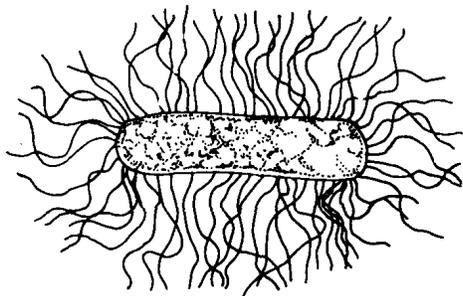


1. In the binomial system of nomenclature, which two classification groups provide the scientific name of an organism?

- A) kingdom and phylum
- B) phylum and species
- C) kingdom and genus
- D) genus and species

2. Base your answer to the following question on the diagram below and on your knowledge of biology.



The organism in the diagram is classified as *Proteus vulgaris*. The term "vulgaris" refers to this organism's

- A) species
- B) genus
- C) family
- D) phylum

3. All of the following are true regarding cells except?

- A) All cells have genetic material
- B) All cells have cell walls
- C) All cells have plasma membranes
- D) All cells can divide to form new cells

4. What is a similarity between all bacteria and plants?

- A) They both have a nucleus
- B) They are both composed of cells
- C) They both have chloroplasts
- D) They both lack a cell wall

5. The cell theory states that

- A) all cells have nuclei that contain genetic information
- B) living organisms are composed of cells that arise from preexisting cells
- C) all cells regenerate and contain the same basic structures
- D) organisms that lack certain organelles reproduce by binary fission

6. During an experiment you want to view the nucleus of a cell. How would you most easily view this organelle?

- A) With a microscope
- B) With the naked eye
- C) Using a magnifying glass
- D) You could not see the nucleus with any of this instruments

7. Which cell structures are correctly paired with their functions?

- A) The mitochondria produce enzymes, and ribosomes transport them.
- B) The ribosomes make proteins, and the nucleus stores genetic information.
- C) The cell membrane make enzymes, and cytoplasm transports them.
- D) The vacuole stores genetic information, and chloroplasts make proteins.

8. The chloroplast is to a plant as

- A) a window is to a building
- B) a solar cell is to a building
- C) a room is to a building
- D) the roof is to a building

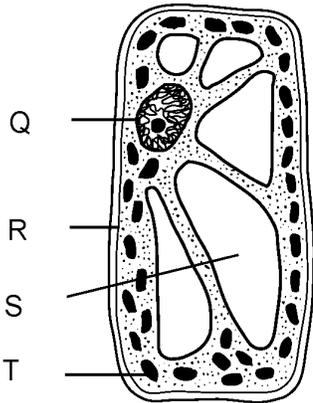
9. Which cell structure is correctly paired with its primary function?

- A) ribosome—protein synthesis
- B) mitochondrion—movement
- C) vacuole—cell division
- D) nucleus—storage of nutrients

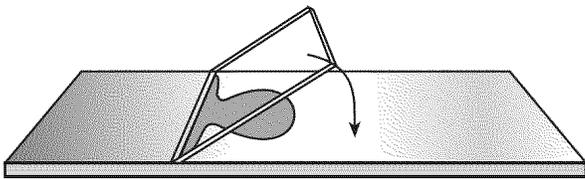
10. Muscle cells in athletes often have more mitochondria than muscle cells in nonathletes. Based on this observation, it can be inferred that the muscle cells in athletes

- A) have a smaller demand for cell proteins than the muscle cells of nonathletes
- B) reproduce less frequently than the muscle cells of nonathletes
- C) have nuclei containing more DNA than nuclei in the muscle cells of nonathletes
- D) have a greater demand for energy than the muscle cells of nonathletes

11. Base your answer to the following question on Which letter indicates a cell structure that directly controls the movement of molecules into and out of the cell?

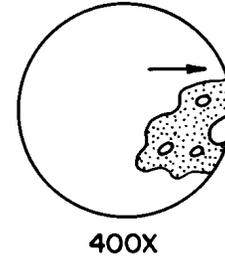


- A) Q B) R C) S D) T
12. One difference between plant and animal cells is that animal cells do *not* have
- A) a nucleus B) chloroplasts
C) a cell membrane D) centrioles
13. The ability of an organism to obtain food, seek shelter, and avoid predators is most directly related to the function of
- A) reproduction B) egestion
C) locomotion D) excretion
14. Base your answer to the following question on The diagram below shows how a coverslip should be lowered onto some single-celled organisms during the preparation of a wet mount.



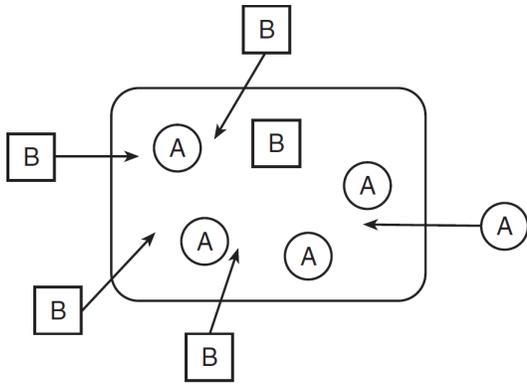
- Why is this a preferred procedure?
- A) The coverslip will prevent the slide from breaking.
B) The organisms will be more evenly distributed.
C) The possibility of breaking the coverslip is reduced.
D) The possibility of trapping air bubbles is reduced.

15. The diagram below shows an ameba moving out of the high-power field of view of a compound microscope in the direction indicated by the arrow.



- What should be done to center the ameba in the field of view and focus it sharply?
- A) Move the slide to the right, and refocus with the fine adjustment.
B) Move the slide to the right, and refocus with the coarse adjustment.
C) Move the slide to the left, and refocus with the fine adjustment.
D) Move the slide to the left, and refocus with the coarse adjustment.
16. A wet-mount slide preparation of a specimen is stained in order to
- A) eliminate some organelles
B) make cell structures more visible
C) use the high-power lens
D) remove water from the slid
17. What cellular structure must oxygen cross to get from the outside to the inside of an animal cell?
- A) The nucleus B) The cytoplasm
C) The cell membrane D) The cell wall
18. A substance is most likely to diffuse into a cell when
- A) it is a large organic food molecule such as protein or starch
B) it is enclosed in an organelle such as a vacuole
C) the concentration of the substance is greater outside the cell than inside
D) the pH of the substance is greater than the pH of the cell

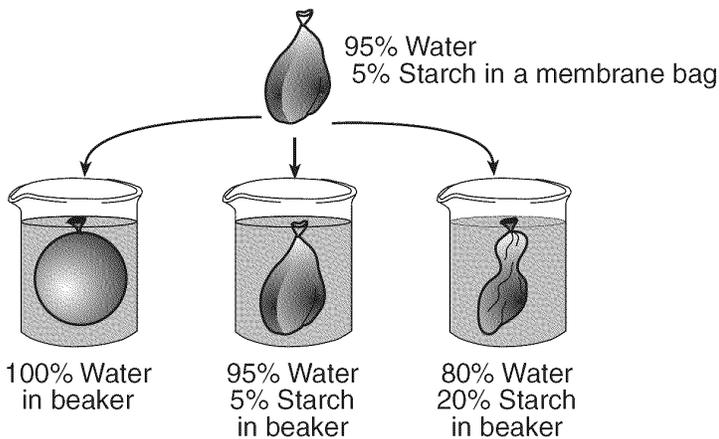
19. The diagram below shows two different kinds of substances, *A* and *B*, entering a cell.



ATP is most likely being used for

- A) substance *A* to enter the cell
- B) substance *B* to enter the cell
- C) both substances to enter the cell
- D) neither substance to enter the cell

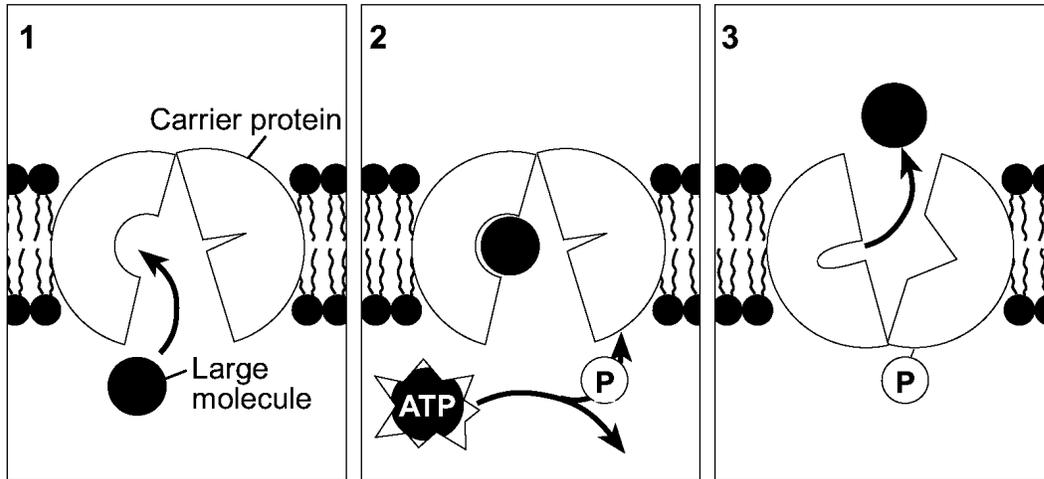
20. Base your answer to the following question on An investigation was set up to study the movement of water through a membrane. The results are shown in the diagram below.



Based on these results, which statement correctly predicts what will happen to red blood cells when they are placed in a beaker containing a water solution in which the salt concentration is much higher than the salt concentration in the red blood cells?

- A) The red blood cells will absorb water and increase in size.
- B) The red blood cells will lose water and decrease in size.
- C) The red blood cells will first absorb water, then lose water and maintain their normal size.
- D) The red blood cells will first lose water, then absorb water, and finally double in size.

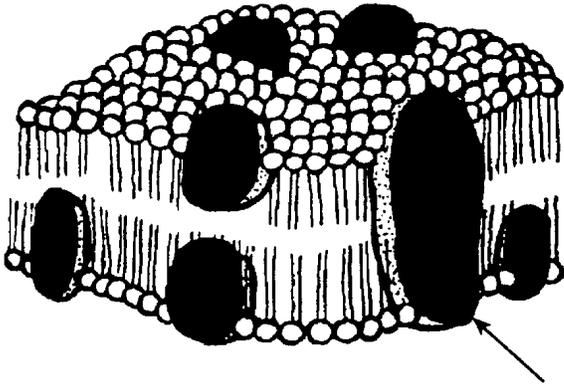
21. Base your answer to the following question on The diagram below represents movement of a large molecule across a membrane.



Which process is best represented in this diagram?

- A) active transport
- B) diffusion
- C) protein building
- D) gene manipulation

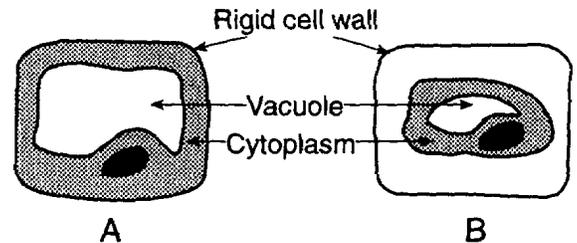
22. Base your answer to the following question on the diagram below which represents the fluid-mosaic model of a cell membrane.



The arrow points to a component of the membrane that is best described as a

- A) sugar floating in lipids
- B) protein floating in lipids
- C) lipid floating in proteins
- D) lipid floating in sugars

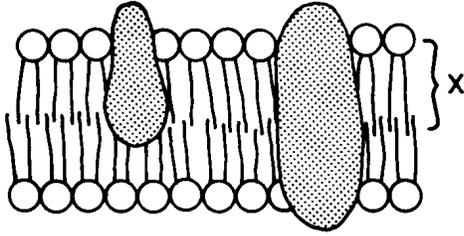
23. Base your answer to the following question on A biologist observed a plant cell in a drop of water as shown in diagram *A*. The biologist added a 10% salt solution to the slide and observed the cell as shown in diagram *B*.



The change in appearance of the cell resulted from

- A) more salt moving out of the cell than into the cell
- B) more salt moving into the cell than out of the cell
- C) more water moving into the cell than out of the cell
- D) more water moving out of the cell than into the cell

24. Base your answer to the following question on The diagram below represents a section of a plasma membrane.



What does structure X represent?

- A) a protein B) glucose
C) a lipid D) glycogen
25. Which process would include a net movement of sugar molecules through a membrane from a region of lower concentration to a region of higher concentration?
- A) osmosis B) cyclosis
C) active transport D) passive transport
26. Base your answer to the following question on the passage below and on your knowledge of biology.

. . . Some of the most common and deadly bacteria do their mischief by forming a sticky scum called biofilm. Individually, the microbes are easy to control, but when they organize themselves into biofilms they can become deadly, said Dr. Barbara Iglewski of the University of Rochester. . .

bio films are actually intricately organized colonies of billions of microbes, all working in a coordinated way to defend against attack and to pump out a toxin that can be deadly.

Once they are organized, the bacteria are highly resistant to antibiotics and even strong detergents often cannot wash them away or kill them.

Iglewski and colleagues from Montana State University and the University of Iowa report in *Science* that they discovered how the microbes in the colonies communicate and found that once this conversation is interrupted, the deadly bugs can be easily washed away.

Using *Pseudomonas aeruginosa*, a common bacteria that is a major infection hazard in hospitals and among cystic fibrosis patients, the researchers isolated a gene that the bacteria uses to make a communications molecule. The molecule helps the microbes organize themselves into a bio film — a complex structure that includes tubes to carry in nutrients and carry out wastes, including deadly toxins.

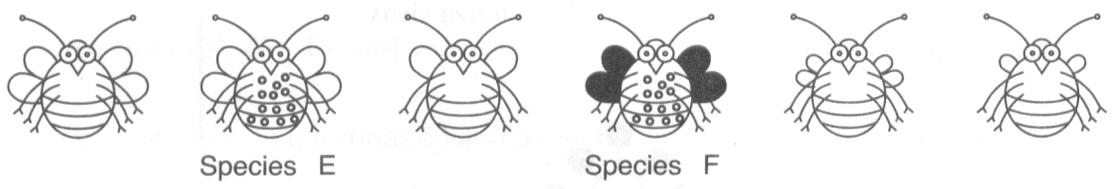
In their study, the researchers showed that if the gene that makes the communications molecule was blocked, the *Pseudomonas aeruginosa* could form only wimpy [weak], unorganized colonies that could be washed away with just a soap that has no effect on a healthy colony. . . .

Adapted from: Paul Recer, “Researchers find new means to disrupt attack by microbes,”
The Daily Gazette, April 26, 1998.

Bacteria that form biofilms may be controlled most effectively by

- A) antibiotics
B) detergents
C) cutting the tubes through which the bacteria communicate
D) blocking the expression of a gene that helps the colonies to organize

27. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents six insect species.



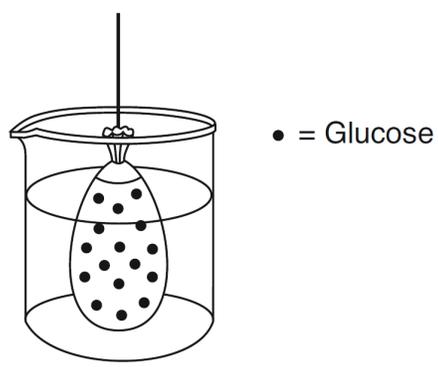
Dichotomous Key

- 1. a. has small wingsgo to 2
 b. has large wings.....go to 3
- 2. a. has a single pair of wingsSpecies A
 b. has a double pair of wingsSpecies B
- 3. a. has a double pair of wingsgo to 4
 b. has a single pair of wings.....Species C
- 4. a. has spotsgo to 5
 b. does not have spotsSpecies D
- 5. a. _____.....Species E
 b. _____.....Species F

A dichotomous key to these six species is shown above. Complete the missing information for sections 5.a. and 5.b. so that the key is complete for all six species.

28. Base your answer to the following question on the information below and on your knowledge of biology.

An artificial cell filled with a glucose solution was placed in a beaker of water, as represented below. The beaker was left undisturbed for 20 minutes.



If both glucose and starch were added to the artificial cell, where would the starch be located after 20 minutes?

29. Base your answer to the following question on the information below and on your knowledge of biology.

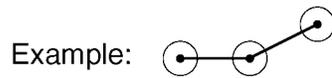
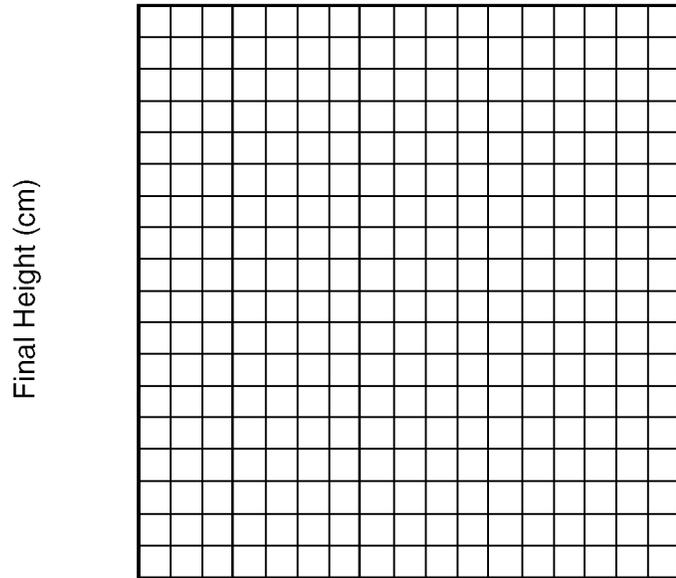
In an investigation, plants of the same species and the same initial height were exposed to a constant number of hours of light each day. The number of hours per day was different for each plant, but all other environmental factors were the same. At the conclusion of the investigation, the final height of each plant was measured. The following data were recorded:

8 hours, 25 cm; 4 hours, 12 cm; 2 hours, 5 cm; 14 hours, 35 cm; 12 hours, 35 cm; 10 hours, 34 cm; 6 hours, 18 cm

Data Table

Daily Light Exposure (hours)	Final Height (cm)

Effect of Light Exposure on Plant Growth



Daily Light Exposure (hours)

- a Organize the data by completing both columns in the data table provided, so that the hours of daily light exposure *increase* from the top to the bottom of the table.
- b Mark an appropriate scale on each axis.
- c Plot the data for final height on the grid. Surround each point with a small circle and connect the points.

Biology (Living Environment)

Name _____

Class _____

Date _____

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28.

29.
Diagram on Separate Sheet
