Biology Ch 7  Cell Structure and Function (7.1-7.2)

For Questions 1–6, complete each statement by writing the correct word or words.

1. The invention of the ___________ made the discovery of cells possible.
2. Robert Hooke used the name ___________ to refer to the tiny empty chambers he saw when he observed magnified cork.
3. German botanist Matthias Schleiden concluded that ___________ are made of cells.
4. German biologist Theodor Schwann concluded that ___________ are made of cells.
5. Rudolph Virchow concluded that new cells are produced from ___________.
6. The ___________ combines the conclusions made by Schleiden, Schwann, and Virchow.
7. Describe the difference in the images seen using a Scanning Electron Microscope and a Transmission Electron Microscope.
   ______________________________________________________________________
   ______________________________________________________________________
8. To study cells with a light microscope, different types of stains are usually available. Why is it generally more useful to stain eukaryotic cells than prokaryotic cells?
   ______________________________________________________________________
   ______________________________________________________________________

9. Complete the table about the two categories of cells.

<table>
<thead>
<tr>
<th>Two Categories of Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Prokaryotic cells</td>
</tr>
<tr>
<td>Eukaryotic cells</td>
</tr>
</tbody>
</table>

10. Which category of cells—prokaryotic or eukaryotic—is your body composed of?

11. Describe the relationship between the cytoplasm and the nucleus of a cell.

12. What does the term *organelle* mean literally?

13. What are vacuoles?
14. What are the two roles of the central vacuole in plant cells?

15. How are contractile vacuoles different from other types of vacuoles?

16. In the diagrams of the animal cell and the plant cell, label the structures indicated by the lines.

17. What is the role of lysosomes in the cell? Why is this a vital role?

18. Which structures of the cytoskeleton are found in animal cells but not in plant cells? What is the function of these parts in animal cells?

19. What other structures of the cytoskeleton would show the same pattern of microtubules as a flagellum?

20. What are ribosomes? What do they do?

21. In which organelle are the lipid components of the cell membrane assembled?

22. What is the difference between rough ER and smooth ER?

23. Describe the role of the Golgi apparatus in cells.
24. Suppose a cell’s Golgi apparatus does not function properly. How might this problem affect other cells?

25. Chloroplasts are never found in animal cells.

26. Unlike chloroplasts, mitochondria are surrounded by a double membrane.

27. Nearly all of the mitochondria in your cells were inherited from your mother.

28. Both chloroplasts and mitochondria lack genetic information in the form of DNA.

29. Most cell _______________ are porous to water and other materials but strong enough to support and protect cells.

30. Nearly all of the plant tissue called _______________ is made up of cell walls.

31. Besides supporting and protecting a cell, the cell membrane _______________ what enters and leaves the cell.

32. Complete the diagram of a section of a cell membrane. Then, on the line below the diagram, write the name of the model that describes the cell membrane’s structure.
For Questions 1–4, write the letter of the correct answer on the line at the left.

1. Which of the following must be true for diffusion to occur?
   A. Molecules or particles must have different sizes.
   B. Special protein channels must always be available.
   C. There must be areas of different concentrations.
   D. Energy must be available.

2. Which term refers to the condition that exists when no net change in concentration results from diffusion?
   A. concentration
   B. equilibrium
   C. osmosis
   D. randomness

3. Air has a higher concentration of oxygen molecules than does the cytoplasm of your lung cells. Where in your lungs will there be a net increase of oxygen?
   A. in the air breathed in
   B. in the air breathed out
   C. outside of the lung cells
   D. inside of the lung cells

4. Which of the following statements tells how facilitated diffusion differs from simple diffusion?
   A. Particles move through cell membranes without the use of energy by cells.
   B. Particles tend to move from high concentration to lower concentration.
   C. Particles move within channel proteins that pass through cell membranes.
   D. Particles tend to move more slowly than they would be expected to move.

For Questions 5–7, match the situation with the result. Write the letter of the correct answer on the line at the left.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Cells are in an isotonic solution</td>
<td>A. The cells lose water</td>
</tr>
<tr>
<td>6. Cells are in a hypotonic solution</td>
<td>B. The cells gain water</td>
</tr>
<tr>
<td>7. Cells are in a hypertonic solution</td>
<td>C. The cells stay the same</td>
</tr>
</tbody>
</table>

8. What is the function of active transport in moving small molecules and ions across cell membranes? Give an example.

9. How does ATP enable transport proteins to move ions across a cell membrane?

10. What are the proteins used in active transport called?
11. Complete the table to summarize the types of bulk transport.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Endocytosis</td>
<td></td>
</tr>
<tr>
<td>Phagocytosis</td>
<td></td>
</tr>
<tr>
<td>Pinocytosis</td>
<td></td>
</tr>
<tr>
<td>Exocytosis</td>
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</table>

12. Most sports drinks are isotonic in relation to human body fluids. Explain why athletes should drink solutions that are isotonic to body fluids when they exercise rather than ones that are hypotonic to body fluids (contain a greater proportion of water in comparison to the fluids in and around human body cells).

For Questions 13–17, complete each statement by writing the correct word or words.

13. The term __________ refers to the relatively constant internal physical and chemical state of a living cell.

14. Unicellular prokaryotes, called ________________, are adapted to living in a remarkable number of different places.

15. Some unicellular eukaryotes, called ________________, contain chloroplasts.

16. Yeasts are unicellular ________________, which are eukaryotes.

17. Other unicellular eukaryotes include ________________ and algae.

18. How do single-celled organisms maintain homeostasis?

19. Why is maintaining homeostasis particularly important to single-celled organisms?

20. How does a multicellular organism maintain homeostasis?
21. The Venn diagram below consists of four concentric circles. Complete the diagram to show the relationships among four levels of organization of life. Use the terms *cells, organ, organ system,* and *tissue.*

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\[\text{Diagram with four concentric circles.}\]
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22. Starting with the outermost circle of the diagram, explain how each level is related to the next level within each circle.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

23. What is the name of the areas that hold adjacent cells together and enable them to communicate?
________________________________________________________________________

For Questions 24-30, match the organelle with its description.

<table>
<thead>
<tr>
<th>Organelle</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>24. Ribosomes</td>
<td>A. Convert energy from sunlight into chemical energy that is stored in food</td>
</tr>
<tr>
<td>25. Endoplasmic reticulum</td>
<td>B. Stack of membranes that modifies, sorts, and packages proteins and other materials for storage or release</td>
</tr>
<tr>
<td>26. Golgi apparatus</td>
<td>C. Convert chemical energy stored in food into a form that can be easily used by the cell</td>
</tr>
<tr>
<td>27. Lysosomes</td>
<td>D. An internal membrane system where lipid components of cell membranes are made</td>
</tr>
<tr>
<td>28. Vacuoles</td>
<td>E. Saclike structures that store materials</td>
</tr>
<tr>
<td>29. Chloroplasts</td>
<td>F. Small particles of RNA and protein on which proteins are assembled using instructions from DNA</td>
</tr>
<tr>
<td>30. Mitochondria</td>
<td>G. Filled with enzymes used to break down carbohydrates into smaller molecules</td>
</tr>
</tbody>
</table>