**Unit 5 Study Guide-Cell Transport (Ch.4)**

This is not worth points, but simply to help you on the unit test. Please check your answers with my key (located on class website).

**Correct the statements below:**

*Every statement is False. Please underline the incorrect portion and rewrite the correct word or phrase on the line below.*

\_\_\_\_ 1. Osmosis is the diffusion of starch molecules through a selectively permeable membrane.

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\_\_\_\_ 2. The sodium-potassium pump doesn’t use ATP.

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\_\_\_\_ 3. A cell placed in a strong salt solution would probably burst because of osmosis.

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\_\_\_\_ 4. In passive transport, energy is required to move a substance across a cell membrane.

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\_\_\_\_ 5. The sodium-potassium pump moves sodium ions and potassium ions down their concentration gradient.

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\_\_\_\_ 6. To pass through a cell membrane, water requires carrier proteins.

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\_\_\_\_ 7. The transport of specific particles down their concentration gradient through a membrane by

carrier proteins is known as simple diffusion.

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\_\_\_\_ 8. Endocytosis helps the cell rid itself of wastes.

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\_\_\_\_ 9. During diffusion, molecules diffuse from a region where their concentration is low to a region

where their concentration is higher, until the particles are evenly dispersed.

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\_\_\_\_ 10. Passive transport uses ATP to move molecules against their concentration gradient.

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**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

\_\_\_\_ 11. The interior portion of a cell membrane forms a nonpolar zone that

|  |  |
| --- | --- |
| a. | allows polar molecules to pass through the membrane. |
| b. | allows food to pass through the membrane. |
| c. | prevents ions and most large molecules from passing through the membrane. |
| d. | allows water to pass directly through the membrane |

\_\_\_\_ 12. Both active transport and facilitated diffusion involve

|  |  |
| --- | --- |
| a. | ATP. |
| b. | movement against a concentration gradient. |
| c. | carrier proteins. |
| d. | energy expended by the cell |



Please label the following parts: Phospholipid Bilayer, Receptor Protein (enzyme), Signal molecule (substrate).

\_\_\_\_ 13. Signal molecules bind to

|  |  |  |  |
| --- | --- | --- | --- |
| a. | carbohydrates | c. | receptor proteins |
| b. | marker proteins | d. | transport proteins |

\_\_\_\_ 14. Refer to the illustration above. What happens when the structure labeled A binds to the structure labeled B?

|  |  |
| --- | --- |
| a. | Information is sent into the cell. |
| b. | Proteins enter the cell. |
| c. | The cell begins to undergo mitosis. |
| d. | None of the above |

\_\_\_\_ 15. When a signal molecule binds to a receptor protein, the receptor protein may

|  |  |
| --- | --- |
| a. | change the permeability of the membrane. |
| b. | cause the formation of a second messenger molecule. |
| c. | catalyze certain chemical reactions in the cell. |
| d. | All of the above |

\_\_\_\_ 16. A molecule can easily pass through the selectively permeable membrane of an animal cell. Which of these most likely describes the molecule?

|  |  |
| --- | --- |
| a. | The molecule is very small and charged |
| b. | The molecule is very large and charged |
| c. | The molecule is very small and not charged |
| d. | The molecule is very large and not charged |

**PROMPT**: Paramecia are unicellular protists. They have a number of characteristics also found in animals, such as the need to ingest food in order to obtain energy (they are heterotrophs), and they are surrounded by a cell membrane but not by a rigid cell wall. They have organelles found in animal cells, including a nucleus, mitochondria, ribosomes, and cilia. In addition, they have star-shaped organelles, called contractile vacuoles, that expel excess water. The illustration below depicts a paramecium.



\_\_\_\_ 17. Refer to the prompt above. If the paramecium is placed into a hypotonic environment what would happen?

|  |  |
| --- | --- |
| a. | The paramecium would shrivel up and eventually die. |
| b. | The paramecium would swell and possibly burst. |
| c. | The paramecium will spontaneously combust. |
| d. | Nothing would happen to the paramecium |

\_\_\_\_ 18. Refer to the prompt above. If the paramecium is placed into a hypertonic environment what would happen?

|  |  |
| --- | --- |
| a. | The paramecium would shrivel up and eventually die. |
| b. | The paramecium would swell and possibly burst. |
| c. | The paramecium will spontaneously combust. |
| d. | Nothing would happen to the paramecium |

\_\_\_\_ 19. Refer to the illustration above. Does the paramecium have a cell membrane?

|  |  |
| --- | --- |
| a. | Yes |
| b. | No |

**Short Answer**

20. Molecules that are too large to be moved through the membrane can be transported into or out of the cell the cell using what organelle?

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21. Draw a line matching the following situations with the correct outcome.

Placing a cell in a hypotonic solution Cell size remains the same

Placing a cell in a hypertonic solution Cell shrinks

Placing a cell in an isotonic solution Cell swells

22. Draw a line matching the following solutions with the correct outcome.

Hypotonic Solution free water is greater inside a membrane.

Hypertonic Solution process of becoming balanced on both sides of a membrane.

Isotonic Solution free water is greater outside of a membrane.

Equilibrium free water is moving at an equal rate in and out of the membrane.

23. Circle the processes that use equilibrium to move substances down concentration gradients.

Diffusion

Osmosis

Endocytosis

Exocytosis

Sodium/Potassium Pump

24. Please circle the types of transport that use energy and underline the ones that don’t.

Simple Diffusion

Osmosis

Endocytosis

Facilitated Diffusion

Sodium/Potassium Pump

Exocytosis

25. What will happen if an animal cell that has a solute concentration of 1% is placed

in a 5% saltwater solution?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

26. Biologically, why do plants become limp and fall over?

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27. Polysaccharides are large, polar molecules. How would you expect them to enter and exit a cell?

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28. Please Label Each Picture correctly (isotonic, hypertonic, or hypotonic)



**A B C**

29. This graph is from data collected on shell-less eggs, which were placed in solutions of three different concentrations. The data shows the changes in egg weight over time. Label Each (A-C) with the correct type of solution (isotonic, hypertonic, hypotonic).



30. Please label the three beakers correctly (isotonic, hypertonic, hypotonic). Then draw arrows to show which way water will move (into or out or the cell). \*\*\*Remember solutes suck!\*\*\*



**A B C**

31. Label each picture correctly (endocytosis or exocytosis)



**A B**

**Unit 5 Study Guide-Cell Transport (Ch.4)**

**Answer Section**

**TRUE/FALSE**

1. ANS: F

Switch: starch with water

2. ANS: F

Cross out the word doesn’t

3. ANS: F

Switch: burst with shrink

4. ANS: F

Switch: Passive with Active

5. ANS: F

Switch: down with against

6. ANS: F

Add the word doesn’t

7. ANS: F

Switch: Simple with Facilitated

8. ANS: F

Switch: Endocytosis with Exocytosis

9. ANS: F

Switch: low with higher

10. ANS: F

Switch: Passive with Active

**MULTIPLE CHOICE**

11. ANS: C

12. ANS: C

13. ANS: C

14. ANS: A

15. ANS: D

16. ANS: C

17. ANS: B

18. ANS: A

19. ANS: A

**SHORT ANSWER**

20. ANS:

vesicles

21. ANS:

Draw a line matching the following situations with the correct outcome.

Placing a cell in a hypotonic solution---cell swells

Placing a cell in a hypertonic solution---cell shrinks

Placing a cell in an isotonic solution---cell size remains the same

22. ANS:

Hypotonic Solution---free water is greater outside of a membrane.

Hypertonic Solution---free water is greater inside a membrane.

Isotonic Solution---free water is moving at an equal rate in and out of the membrane.

Equilibrium---process of becoming balanced on both sides of a membrane.

23. ANS:

Circle the processes that use equilibrium.

**Diffusion**

**Osmosis**

Endocytosis

Exocytosis

Sodium/Potassium Pump

24. ANS:

Please **circle** the types of transport that use energy and underline the ones that don’t.

Simple Diffusion

Osmosis

**Endocytosis**

Facilitated Diffusion

**Sodium/Potassium Pump**

**Exocytosis**

25. ANS:

It will shrink because there is less water outside the cell than there is on the inside

26. ANS:

Lost turgidity

27. ANS:

Facilitated Diffusion

28. ANS:

A-Hypertonic

B-Isotonic

C-Hypotonic

29. ANS:

A-Hypotonic

B-Isotonic

C-Hypertonic

30. ANS:

A-Isotonic (water moves in and out)

B-Hypotonic (water moves into)

C- Hypertonic (water moves out)

31. ANS:

A-endocytosis

B-Exocytosis