

100 Excellent

4. Cell Structure & Function homework questions

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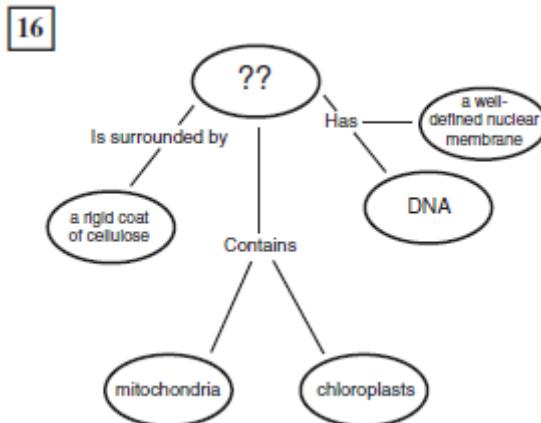
Instructions: Using this as a template, create space and type or write your answers below. KEEP THE SAME NUMBERING. Turn in your completed work by the due date.

(25 questions, 100 points)

1. The smallest unit of biological structure that meets the functional requirements of “living” is the
 - a. organ
 - b. organelle
 - c. **cell**
 - d. macromolecule
2. Which of these do all prokaryotic and eukaryotic cells share?
 - a. nuclear envelope
 - b. cell walls
 - c. organelles
 - d. **plasma membrane**
3. Prokaryotes depend on _____ to obtain some materials and to get rid of wastes
 - a. Ribosomes
 - b. Flagella
 - c. Cell division
 - d. **Diffusion**
4. Which of the following is found both in eukaryotic and prokaryotic cells?
 - a. nucleus
 - b. mitochondrion
 - c. vacuole
 - d. **ribosome**
5. The presence of a membrane-enclosed nucleus is a characteristic of
 - a. prokaryotic cells
 - b. **eukaryotic cells**
 - c. living organisms
 - d. bacteria
6. The cell membrane (plasma membrane) of a cell consists of
 - a. Protein molecules arranged in two layers with polar areas forming the outside of the membrane
 - b. **Two layers of phospholipids, organized with the nonpolar tails forming the interior of the membrane**
 - c. Lipid molecules positioned between two carbohydrate layers
 - d. Protein molecules with polar and nonpolar tails
7. The cell membrane of a certain cell will allow water, oxygen, carbon dioxide, and glucose to pass through. Because other substances are blocked from entering, this membrane is called
 - a. Perforated

- b. Semi-permeable
- c. Non-conductive
- d. Permeable

8. Which of these descriptions *best* completes this concept map?



- a. An animal cell
 - b. A prokaryotic cell
 - c. A virus
 - d. A plant cell
9. Eukaryotic cells are differentiated from prokaryotic cells because eukaryotic cells
- a. Are much smaller
 - b. Have permeable membranes
 - c. Have a higher rate of reproduction
 - d. Have nuclei
10. Which cellular organelle is responsible for packaging the proteins that the cell secretes?
- a. Cytoskeleton
 - b. Cell membrane
 - c. Lysosome
 - d. Golgi apparatus
11. Which of the following is found both in eukaryotic and prokaryotic cells?
- a. Nucleus
 - b. Mitochondrion
 - c. Vacuole
 - d. Ribosomes
12. Which of the following is not a component of the endomembrane system?
- a. Mitochondrion
 - b. Golgi apparatus
 - c. Endoplasmic reticulum
 - d. Lysosome
13. The process by which a cell engulfs a foreign particle is known as
- a. Endosymbiosis

- b. Phagocytosis
 - c. Hydrolysis
 - d. Membrane synthesis
14. Describe what is meant by the “Cell Theory” or “Unified Cell Theory”? State all three (3) basic principles.

The unified cell theory is a combination of three different principles, they are unified. It states that all living things are composed of one or more cells, the cell is the basic unit of life, and new cells arise from existing cells.

15. Describe how the surface area of a cell can influence the maximum size a cell might attain.

The cell will be too big and substances will not be able to travel across the cell fast enough to meet its needs.

16. Describe the structure and function of the cell membrane (plasma membrane).

The cell membrane defines the cell, outlines its borders, and determines the nature of its interaction with its environment.

17. Describe the two functions of cilia.

Cilia function to move a cell or group of cells or to help transport fluid or materials past them.

18. Describe the structure of the plant cell wall. Is it living? Why or why not?

The cell wall maintains the cell’s shape, it is an external structure made out of cellulose, it is not living because the cell is the smallest living thing.

19. Describe the differences between isotonic, hypotonic, and hypertonic solutions.

In a hypertonic solution, the extracellular fluid has a higher osmolality than the cell’s cytoplasm. In a hypertonic solution the extracellular fluid has a lower osmolality than the cell’s cytoplasm. In a isotonic solution the osmolality of the extracellular fluid and the cell’s cytoplasm are the same.

20. Explain the difference between simple diffusion and facilitated diffusion.

In diffusion the particles pass right through the membrane without any assistance because charges do not hinder their passage through the cell membrane. In facilitated diffusion the particles go through proteins which shield them from hindering charges so that they can pass into the cell.

21. Explain the difference between facilitated diffusion and active transport.

The proteins in active transportation actively pump particles in and out of the cell membrane. Whereas in facilitated diffusion the particles are just simply carried or pass through proteins that shield them.

22. Describe the process of endocytosis.

The plasma membrane of the cell invaginates, forming a pocket around the target particle. The pocket pinches off, resulting in the particle being contained in a newly created intracellular vesicle formed from the plasma membrane.

23. Prokaryotic cells (bacteria) are much smaller and simpler than eukaryotic cells. What advantages might small cell size and simplicity confer on a cell?

It may make transportation of the cell much easier due to the light weight. It may create easy reproduction.

24. How do cilia and flagella differ?

Cilia are short and extend from the surface of the cell. Flagella are long string like appendages.

25. “Fluid Mosaic Model”: Why is it advantageous for the cell membrane to be fluid in nature?

The cell is more flexible and it is crucial to the cell's function. If you have a white blood cell, and it is not fluid, it will not be able to engulf foreign particles.