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Science Bowl Questions

25 Toss-ups

Biology

1. *Short Answer*: What is the property of biological membranes that allows some substances to cross more easily than others?

ANSWER: Selective permeability.

2. *Multiple Choice*: Membranes are arranged in which of the following structures?

W. Static sheets of molecules locked rigidly in place.

X. Blocks of phospholipids arranged in a grid.

Y. Many, many phospholipids held together by hydrophobic interactions.

Z. Many, Many phospholipids held together by hydrophilic interactions.

ANSWER: Y

3. *Short answer*: In order to function properly, a cell’s plasma membrane should be in what state of matter?

ANSWER: Liquid OR Fluid

4. *Multiple Choice*: Which of the following is NOT a function of proteins in the plasma membrane?  
 W. To transport substances across the plasma membrane.

X. To serve as identification tags that are recognized by other cells.

Y. To perform enzymatic activity.

Z. To help a cell hook with a protein of an adjacent cell.

5. *Short Answer:* What name is given to a molecule made up of a membrane carbohydrate covalently bonded to a protein?

ANSWER: Glycoproteins.

6. *Multiple Choice:* Which best describes the path membrane proteins and lipids follow to their place in the plasma membrane?

W. Endoplasmic Reticulum 🡪 Golgi Apparatus 🡪 Vesicle 🡪 Plasma Membrane

X. Endoplasmic Reticulum 🡪 Plasma Membrane

Y. Endoplasmic Reticulum 🡪 Golgi Apparatus 🡪 Plasma Membrane

Z. Endoplasmic Reticulum 🡪 Mitochondrion 🡪 Plasma Membrane.

ANSWER: W

7. *Short Answer:* What is the name given to a transmembrane protein that helps a certain substance or class of closely related substances to cross the membrane?

ANSWER: Transport proteins.

8. *Multiple Choice:* What name is given to the diffusion of a substance across a biological membrane?

W. Passive Transfer

X. Osmosis

Y. Passive Transport

Z. Active Transport

ANSWER: Y

9. *Short Answer:* What name is given to the diffusion of water across a selectively permeable membrane?

ANSWER: Osmosis

10. *Multiple Choice:* An animal cell is immersed in a solution of salt-water. The cell loses water to this solution, shrivels and dies. The solution was a—

W. Isotonic solution.

X. Hypertonic solution.

Y. Hypotonic solution.

Z. Hemotonic solution.

ANSWER: X

11. *Short Answer:* The control of water balance used to prevent excessive uptake or loss of water in a cell is called what?

ANSWER: Osmoregulation

12. *Multiple Choice:*  What does it mean for a plant cell to be turgid?

W. For there to be very little water in the plant cell, so that it is very unhealthy.

X. For there to be very much water in the plant cell, so that it is very unhealthy.

Y. For there to be very little water in the plant cell, so that it is very healthy.

Z. For there to be very much water in the plant cell, so that it is very healthy.

ANSWER: Z

13. *Short Answer:* What is the phenomenon where a plant cell’s plasma membrane pulls away from the cell wall due to a hypertonic environment?

ANSWER: Plasmolysis

14. *Multiple Choice:* Which of the following is not a form of transportation of substances across the plasma membrane?

W. Osmosis

X. Active Transport

Y. Passive Transport

Z. Ionic Transport

ANSWER: Z

15. *Short Answer:* What is the name of the compound that supplies the energy most active transport?

ANSWER: Adenosine Triphosphate (ATP)

16. *Short Answer:* What is the cellular secretion of macromolecules by the fusion of vesicles with the plasma membrane?

ANSWER: Exocytosis

17. *Short Answer:* What membranous structure is made from the plasma membrane during the process of endocytosis?

ANSWER: Vesicle

18. *Multiple Choice:* Which of the following is not a type of endocytosis?

W. Phagocytosis

X. Pinocytosis

Y. Receptor-mediated endocytosis

Z. Phemocytosis

19. *Short Answer:* What is a transmembrane protein with hydrophobic regions that completely spans the hydrophobic interior of the membrane called?

ANSWER: Integral proteins.

20. *Short Answer:* What is a protein appendage loosely bound to the surface of a membrane and not embedded in the lipid bilayer called?

ANSWER: Peripheral protein.

21. *Multiple Choice:* Does glycolysis require oxygen to take place? What about the Krebs Cycle?

W. Glycolysis requires oxygen to take place, and so does the Krebs Cycle.

X. Glycolysis does not require oxygen to take place, and neither does the Krebs Cycle.

Y. Glycolysis does not require oxygen to take place, but the Krebs Cycle does.

Z. Glycolysis requires oxygen to take place, but the Krebs Cycle does not.

ANSWER: Y

22. *Multiple Choice:* What type of fermentation often takes place in yeast?

W. Lactic acid fermentation

X. Citric acid fermentation

Y. Pyruvate fermentation

Z. Alcohol fermentation

ANSWER: Z

23. *Short Answer:* What are the microscopic pores in leaves through which carbon dioxide enters and oxygen exits called?

ANSWER: Stomata

24. *Short Answer:* What substance is the starting material of the Calvin Cycle?

ANSWER: Carbon Dioxide

25. *Multiple Choice:* Which of the following is NOT part of the kidney’s excretory system?

W. Glomerulus

X. Modular

Y. Bowman’s capsule

Z. Renal Proximal tubule