KEY

MEMBRANE STRUCTURE AND FUNCTION MULTIPLE CHOICE PRACTICE

NAME:_____

_____1. The major functions of the plasma membrane do **Not** include
a) separation of the fluid environments inside and outside the cell.
b) regulation of molecules and ions that pass into and out of the cell.
c) recognition and communication between different cells and tissues.
d) maintaining connections between adjacent cells
e) production of proteins used in construction of the cell wall.

_____2. When plant cells are exposed to a hypertonic solution they ____ and exhibit the phenomenon called _____.
a) expand, plasmolysis
b) shrink, plasmolysis
c) expand, turgor pressure
d) shrink, turgor pressure
e) remain the same, crenation

_____3. The current theory of the structure of the plasma membrane is best described by the _____ model.
a) sandwich b) fluid-mosaic c) unit membrane d) electrochemical e) unipermeable

_____4. In a phospholipid bilayer, the
a) phosphate groups are hydrophobic. ✗
b) fatty acids tails are ionized.
c) fatty acid tails are hydrophilic ✗
d) proteins are located only between the two layers. ✗
e) phosphate heads are oriented toward the exterior of the cell or toward the cytoplasm.

_____5. Which statement is **True** about the plasma membrane?
a) The proteins make up the matrix of the membrane.
b) The model can be likened to a sandwich where phospholipids are like the bread and proteins are like the filling. ← NOT ON EXAM
c) The fluid nature of the membrane is regulated by flip-flopping of the phospholipids from one side of the membrane to the other.
d) Movement of proteins and phospholipids can occur sideways within the plane of the membrane.

_____6. Which phrase does **Not** describe one of the functions of proteins of the plasma membrane?
a) forming a channel through the membrane ✓
b) initiating the replication of the genetic material → yes but not plasma membrane proteins
c) binding to a substance to carry it through the membrane ✓
d) acting as a receptor for substances external to the cell ✓
e) increasing the rate of a chemical reaction

_____7. Whether a molecule can cross the plasma membrane depends upon
a) the size of the molecule
b) the shape of the molecule
c) the chemical properties of the molecule

d) the charge of the molecule
c) All of the above.

_____8. Which is the **Best** definition of diffusion?
a) movement of molecules from an area of their higher concentration to an area of their lower concentration ✓
b) movement of water across a semipermeable membrane from an area of high water concentration to an area of lower water concentration. osmosis
c) movement of molecules from an area of their lower concentration to and area of their higher concentration. ✗
d) movement of water across a semipermeable membrane from an area of low water concentration to an area of higher water concentration.
e) movement of a substance against its concentration through the release of energy from ATP.

_____9. Which is the **Best** definition of osmosis?
a) movement of molecules from an area of their higher concentration to an area of their lower concentration
b) movement of water across a semipermeable membrane from an area of high water concentration to an area of lower water concentration.
c) movement of molecules from an area of their lower concentration to and area of their higher concentration.
d) movement of water across a semipermeable membrane from an area of low water concentration to an area of higher water concentration.
e) movement of a substance against its concentration through the relea se of energy from ATP.

Note
- it goes to high solute concentration to "dilute" that side. ∴ ↓$[H_2O]$ to ↑ $[H_2O]$

_____10. Plants show turgor pressure when
a) cells are losing water from their water vacuoles.
b) cells contain water vacuoles that are full of water.
c) water is being used up in photosynthesis.
d) water is being evaporated from the leaves.

_____11. If a cell is placed in a hypotonic solution, which will occur?
a) Salts will move into the cell from the surrounding solution.
b) Water will move into the cell from the surrounding solution.
c) Salts will move out of the cell into the surrounding solution.
d) Water will move out of the cell into the surrounding solution.
e) None of the above will occur.

Water moves, not solutes!

_____12. If a cell is placed in a hypertonic solution, which will occur?
a) Salts will move into the cell from the surrounding solution.
b) Water will move into the cell from the surrounding solution.
c) Salts will move out of the cell into the surrounding solution.
d) Water will move out of the cell into the surrounding solution.
e) None of the above will occur.

_____13. If a cell is placed in an isotonic solution, which will occur?
a) Salts will move into the cell from the surrounding solution.
b) Water will move into the cell from the surrounding solution.
c) Salts will move out of the cell into the surrounding solution.
d) Water will move out of the cell into the surrounding solution.
e) None of the above will occur.

Neither

_____14. _____ is a shrinking of the cytoplasm due to osmosis.
a) Plasmolysis b) Endocytosis c) Crenation d) Diffusion e) Turgor

_____15. Which is the **Best** definition of active transport?
a) movement of molecules from an area of their higher concentration to an area of their lower concentration
b) movement of water across a semipermeable membrane from an area of high water concentration to an area of lower water concentration.
c) movement of molecules from an area of their lower concentration to and area of their higher concentration.
d) movement of water across a semipermeable membrane from an area of low water concentration to an area of higher water concentration.
e) movement of a substance against its concentration through the release of energy from ATP.

_____16. The sodium-potassium pump moves sodium and potassium ions across the plasma membrane by
a) facilitated transport b) active transport c) cotransport d) endocytosis e) exocytosis

_____17. Which term is derived from the Greek root word meaning "out of cell"?
a) osmosis b) endocytosis c) tonicity d) diffusion e) exocytosis

_____18. Cell products are secreted from the cell through
a) facilitated transport b) active transport c) cotransport d) endocytosis e) exocytosis

_____19. Pinocytosis is an example of
a) facilitated transport b) passive transport c) cotransport d) endocytosis e) exocytosis

_____20. Eukaryotic cells are substantially larger than bacteria cells and average over 20 times more volume per surface area than bacteria cells. How can the eukaryotic cell membrane provide this higher rate of exchange of materials?
a) Plasma membrane folds increase the surface area.
b) Carrier proteins speed the rate at which a solute crosses the plasma membrane in the direction of decreasing concentration.
c) Mitochondria are concentrated near membranes to provide energy for active transport of molecules or ions.
d) Large molecules are engulfed by vesicle formation.
e) All of the above are true.

_____21. A phospholipid molecule has a head and two tails. The tails are found
a) at the surface of the membrane
b) in the interior of the membrane
c) spanning the membrane
d) where the environment is hydrophilic
e) Both a and b are correct.

_____22. During diffusion
a) solvents move from the area of higher to lower concentration but not the solutes.
b) there is a net movement of molecules from an area of higher to lower concentration.
c) a cell must be present for any movement of molecules to occur.
d) molecules move against their concentration gradient if they are small or charged.
e) All of these are correct.

_____23. Active transport
a) requires a carrier protein.
b) moves a molecule against its concentration gradient.
c) requires a supply of chemical energy.
d) does not occur during facilitated transport.
e) All of these are correct.

_____24. The sodium potassium pump
a) helps establish an electrochemical gradient across the membrane.
b) concentrates sodium on the outside of the membrane.
c) utilizes a carrier protein and chemical energy.
d) is present in the plasma membrane
e) All of these are correct.

_____25. Which of the following forms of cell transport requires the input of energy?
a) diffusion
b) osmosis
c) facilitated diffusion
d) movement of a solute down its concentrated gradient
e) active transport

_____26. Among the following choices, which one would most readily move through a selectively permeable membrane?
a) small uncharged polar molecules
b) protein hormone
c) large uncharged polar molecules
d) glucose
e) sodium ion

_____27. Which of the following requires the input of energy?
a) osmosis
b) facilitated diffusion
c) diffusion
d) sodium potassium pump
e) movement of water down its concentration gradient

_____28. A cell is placed into a hypertonic environment and its cytoplasm shrivels up. This demonstrates the principle of
a) photolysis b) diffusion c) active transport d) facilitated diffusion e) plasmolysis

_____29. ATP is required for all of the following processes Except
a) active transport by transport proteins
b) facilitated diffusion
c) microtubule movement within flagella.
d) Na+/K+ pump activity
e) protein synthesis

_____30. Facilitated diffusion
a) is a type of passive transport
b) moves molecules down the concentration gradient
c) is made possible by specific molecules within the membrane
d) requires no expenditure of energy
e) All of the above apply.

_____31. When plant cells are exposed to a hypotonic solution they ____ and exhibit the phenomenon called _____.
a) expand, plasmolysis
b) shrink, plasmolysis
c) expand, turgor pressure
d) shrink, turgor pressure
e) remain the same, crenation