

7. Which of the following statements (A-D) about water is FALSE? If statements A-D are true, then choose E.
- A. Water has higher heats of fusion and evaporation than typical for a molecule its size
 - B. Liquid water is less dense than solid water**
 - C. Water has high surface tension
 - D. It is much more difficult to heat up a gram of water than is typical for a molecule its size
 - E. All of the above statements about water are TRUE
8. What is different when comparing two isotopes of the same element?
- A. The number of protons
 - B. The number of neutrons
 - C. The number of electrons
9. Which of the following molecules is not a polymer?
- A. DNA
 - B. Proteins
 - C. Steroids**
 - D. Polysaccharides
 - E. All are polymers
10. Which of the following molecules are not found associated with the plasma membrane?
- A. DNA**
 - B. Proteins
 - C. Cholesterol
 - D. Phospholipids
 - E. All of the above are associated with the plasma membrane
11. When starch is broken down during digestion, what type of reaction is taking place?
- A. Hydrolysis**
 - B. Condensation
 - C. Glycosidic
 - D. Degeneration
 - E. None of the above
12. Which of the following is an ionic solid?
- A. Sucrose
 - B. CO₂
 - C. H₂O
 - D. NaCl*
13. How many electrons does it take to fill the second electron shell?
- A. 2
 - B. 4
 - C. 6
 - D. 8**
 - E. 10
14. Which of the following molecules is the most hydrophobic?
- A. H₂O
 - B. CO₂
 - C. NH₃
 - D. C₂H₆**
 - E. Na⁺
15. Which of the following statements (A-D) about lipids is FALSE. If statements A-D are true, then choose E.
- A. Steroids are a type of lipid
 - B. Phospholipids are amphipathic molecules
 - C. Lipids have more energy per gram than proteins and polysaccharides
 - D. Phospholipids will spontaneously form micelles and lipid bilayers
 - E. All of the above statements about lipids are TRUE**
16. Which of the following is an example of a protein tertiary structure?
- A. An alpha helix
 - B. A disulfide bridge (sulfhydryl bond) between two amino acids**
 - C. The joining of the four subunits in hemoglobin
 - D. The sequence of amino acids in one of the hemoglobin subunits
 - E. None of the above.

17. Which of the following bonds is the most reduced?
 A. H-O B. C-O C. C-H D. N-H E. None of the above
I threw this question out - it was worded very poorly. Everyone got credit for this question
18. Which of the following is not a component of a nucleotide?
 A. **An amino and a carboxyl end** B. A phosphate group
 C. A ribose sugar D. A nitrogenous base
 E. All of the above are components of a nucleotide
19. What is the difference between DNA and RNA nucleotides
 A. The position of the phosphate group
 B. RNA possesses a hydroxyl (-OH) group on the 2' carbon
 C. DNA and RNA have some unique nitrogenous bases
D. B & C
 E. A, B, & C
20. The molecule below is an example of a:

 A. **Lipid** B. Polysaccharide C. Protein D. Nucleic Acid
21. ATP and NADH most are most similar to a(n):
 A. Lipid B. Sugar C. Amino Acid **D. Nucleotide**
22. Which of the following statements (A-D) about enzymes is FALSE. If statements A-D are true, then choose E.
 A. **Enzymes are consumed in a chemical reaction**
 B. Enzymes are important for coupling endergonic and exergonic reactions
 C. Enzymes can be denatured by excessive temperature
 D. Enzymes may be allosterically controlled
 E. All of the above statements about enzymes are TRUE
23. Stomach acid is pH 3. Pepsin is an enzyme which is secreted into the stomach to digest proteins. What would you predict to be the pH optimum of pepsin?
 A. pH 1 **B. pH 3** C. pH 5 D. pH 7 E. pH 9
24. Which of the following statements (A-D) about enzymes is FALSE. If statements A-D are true, then choose E.
 A. Enzymes are very sensitive to external environmental conditions
 B. Enzymes often have an induced fit when a substrate binds to the active site
 C. Enzymes and substrates form a temporary enzyme-substrate complex during the reaction
D. An allosteric site is the site where the substrates bind
 E. All of the above statements about enzymes are TRUE

34. Which of the following statements (A-D) about cilia and flagella is FALSE? If statements A-D are true, then choose E.
- A. Cilia and flagella are involved in movement of cells
 - B. Both cilia and flagella have a 9+2 arrangement of microtubules
 - C. Cilia and flagella are found in eukaryotic cells
 - D. Cilia and flagella are the same thing, basically the only difference is that flagella are longer and less numerous
 - E. All of the above statements about cilia and flagella are TRUE**
35. Ribosomes are used in:
- A. Protein synthesis**
 - B. Lipid synthesis
 - C. Membrane synthesis
 - D. Endoplasmic reticulum stabilization
 - E. None of the above
36. Which of the following is continuous with the endoplasmic reticulum?
- A. The inner nuclear membrane
 - B. The outer nuclear membrane**
 - C. The Golgi bodies
 - D. The lysosome membrane
 - E. None of the above
37. Which of the following organelles is involved in packaging and distribution of proteins?
- A. Rough Endoplasmic Reticulum
 - B. Smooth Endoplasmic Reticulum
 - C. Golgi bodies**
 - D. Lysosome
 - E. Plasma membrane
38. Proteins that enter the endoplasmic reticulum usually have what associated with them?
- A. A sugar**
 - B. A signal lipid
 - C. A specific amino acid sequence
 - D. RNA
 - E. None of the above
39. Functional mitochondria are found in living plant cells
- A. True**
 - B. False
40. Which of the following is not a component of the Fluid Mosaic Model of the plasma membrane?
- A. The membrane is a lipid bilayer composed primarily of phospholipids
 - B. Cholesterol is associated with the lipid bilayer
 - C. Proteins are asymmetrically associated with the plasma membrane
 - D. Molecules in the plasma membrane have some lateral mobility
 - E. All of the above are components of the Fluid Mosaic Model**
41. Which of the following increase membrane fluidity?
- A. Saturated fatty acids
 - B. Unsaturated fatty acids**
 - C. Cholesterol
 - D. Longer fatty acid chains
 - E. Colder temperatures

42. A type O woman has a type A baby. How many of the following men could you eliminate as the potential father?
 Louie (type O) Gerry (type A) Biff (type B) Wayne (Type AB)
- A. One **B. Two** C. Three D. Four
43. An integral protein will typically have which of the following?
 A. An alpha helix with many hydrophilic -R groups
B. An alpha helix with many hydrophobic -R groups
 C. A beta pleated sheet with many hydrophilic -R groups
 D. A beta pleated sheet with many hydrophobic -R groups
 E. None of the above
44. Which of the following molecules is a steroid?
 A. Phospholipid B. Sphingolipids C. Cholesterol D. Ceramides
45. Which of the following molecules is least likely to cross a plasma membrane?
 A. O₂ B. H₂O C. CO₂ D. Na⁺ E. C₂H₆
I threw this question out - it should have said, which of the following molecules is least likely to diffuse across a plasma membrane - this would have been Na⁺
46. Which of the following statements (A-D) about diffusion is FALSE. If statements A-D are true, then choose E.
 A. Diffusion is a passive process
B. The size of the molecule will not affect diffusion rate
 C. Increasing system temperature will increase diffusion rate
 D. Objects diffuse from areas of greater concentration to areas of lesser concentration
 E. All of the above statements about diffusion are TRUE.
47. Which of the following statements (A-D) about osmosis is FALSE. If statements A-D are true, then choose E.
 A. Osmosis is the diffusion of water
 B. The type of osmotically active solute is not important - only the final concentration
 C. Osmosis produces a force
D. Water will move from a hypertonic solution to a hypotonic solution
 E. All of the above statements about osmosis are TRUE

Use the key below to answer questions 48 and 49.

I. Diffusion II. Facilitated Diffusion III. Active Transport

48. Which of the following can move solutions from areas of greater concentration to areas of lesser concentration?
 A. I only B. I, II C. II, III D. I, III **E. I, II, III**

49. Which of the following require a carrier protein?
A. I only B. I, II C. **II, III** D. I, III E. I, II, III
50. Which of the following statements (A-D) about the Na⁺/K⁺ pump is FALSE. If statements A-D are true, then choose E.
A. The Na⁺/K⁺ pump is an example of active transport
B. The Na⁺/K⁺ pump is an antiport
C. The Na⁺/K⁺ pump transports three Na⁺ out of the cell and two K⁺ into the cell
D. The Na⁺/K⁺ pump is an example of an integral protein
E. **All of the above statements about the Na⁺/K⁺ pump are TRUE**
51. In the H⁺ / Sucrose pump system, what *directly* drives the movement of sucrose into the cell?
A. ATP synthesis B. ATP hydrolysis
C. The concentration gradient of sucrose **D. The concentration gradient of H⁺**
52. Which of the following statements about glucose facilitated transporters is FALSE?
A. The protein carrier is very specific and will only bind glucose
B. The protein carrier is fully reversible
C. The protein carrier will saturate (i.e. there is a maximum rate that they can transport glucose)
D. **The protein carrier can transport glucose against its concentration gradient**
E. The protein carrier has two conformations, one open to the outside and one open to the inside