**Chapter 4**

1. The membrane is referred to as a "fluid mosaic" structure. Which of the following statements is true?
   1. The fluid is phospholipid, and the mosaic is carbohydrate.
   2. The fluid is protein, and the mosaic is embedded protein in phospholipid.
   3. The mosaic comprises the carbohydrate chains on the inner surface of the membrane.
   4. The fluid is phospholipid, and the mosaic is protein.
2. Stability of an animal cell plasma membrane is enhanced by \_\_\_\_\_.
   1. cholesterol molecules
   2. saturated triglycerides
   3. saturated phospholipids
   4. polyunsaturated triglycerides
3. Proteins perform a number of functions within membranes. Which of the following statements is true about membrane proteins?
   1. Proteins keep the membrane fluid.
   2. Proteins form the basis of the semipermeable membrane.
   3. Proteins allow for the transportation of small, nonpolar, hydrophobic molecules.
   4. Proteins facilitate membrane stabilization.
4. Which of the following statements is true about passive transport?
   1. Passive transport operates independently of diffusion.
   2. Passive transport phenomena can never reach equilibrium.
   3. Passive transport does not occur in the human body.
   4. Passive transport requires no expenditure of cellular energy.
5. The movement of atoms, ions, or molecules from a region of higher concentration to regions of lower concentration is called \_\_\_\_\_.
   1. spontaneous combustion
   2. diffusion
   3. heat
   4. active transport
6. Which of the following statements is true about diffusion?
   1. It requires expenditure of energy by the cell.
   2. It is a passive process.
   3. It occurs when molecules move from a region of lower concentration to a region of higher concentration.
   4. It requires membrane proteins.

1. The diffusion of water across a selectively permeable membrane is called \_\_\_\_\_.
   1. active transport
   2. osmosis
   3. passive transport
   4. facilitated diffusion
2. Seawater is dangerous to drink because \_\_\_\_\_.
   1. one cup of seawater contains enough sodium to poison you
   2. sea water is hypertonic to your body tissues and drinking it will cause you to lose water by osmosis
   3. seawater is isotonic to your body fluids and you will absorb too much water, causing your cells to burst
   4. it contains toxic levels of iodine
3. Which of the following is a difference between active transport and facilitated diffusion?
   1. Active transport involves transport proteins, and facilitated diffusion does not.
   2. Facilitated diffusion requires energy from ATP, and active transport does not.
   3. Facilitated diffusion involves transport proteins, and active transport does not.
   4. Active transport requires the expenditure of cellular energy, and facilitated diffusion does not.
4. Which statement best describes phagocytosis?
   1. A cell engulfs a particle and packaging it within a vacuole.
   2. Small droplets of extracellular fluid and all the dissolved solutes enter the cell by this process.
   3. A receptor on the plasma membrane binds to a molecule, and the cell engulfs both the receptor and the molecule.
   4. After entry, the endocytotic vesicle migrates to and fuses with the Golgi apparatus.
5. Which one of the following is an example of the second law of thermodynamics?
   1. The aerobic respiration of glucose generates heat.
   2. CO2 is exhaled as a by-product of aerobic respiration.
   3. Photosynthesis enables plants to create energy from sunlight.
   4. Energy is stored during the Calvin cycle.
6. Cellular respiration is an example of \_\_\_\_\_.
   1. an endergonic reaction
   2. an exergonic reaction
   3. thermodynamics
   4. entropy
7. The phosphorylation of ADP to form ATP is an \_\_\_\_\_ reaction that \_\_\_\_\_ energy.
   1. endergonic … requires an input of
   2. exergonic … releases kinetic
   3. endergonic … releases
   4. exergonic … requires an input of
   5. exergonic … releases potential
8. The mechanism of enzyme action is to \_\_\_\_\_.
   1. create an energy barrier between substrates
   2. lower the energy of the activation of a reaction
   3. change endergonic into exergonic reactions
   4. allow substrates to move more freely in solution
9. If the tertiary structure of an enzyme is changed, \_\_\_\_\_.
   1. its substrate may not fit properly in the active site
   2. it will be missing one of its polypeptides
   3. the helical coil will be stretched out
   4. the product of the reaction will be a different molecule
10. Which of these statements about enzyme inhibitors is true?
    1. A competitive inhibitor binds to the enzyme active site.
    2. The action of competitive inhibitors is irreversible.
    3. A noncompetitive inhibitor does not change the shape of the active site.
    4. Antibiotics and pesticides generally do not act on enzymes, but rather affect the genetic code of their intended organisms.
11. Which of the following statements is correct about diffusion?
12. It is an active process in which molecules move from a region of lower concentration to one of higher concentration.
13. It requires integral proteins in the cell membrane.
14. It is a passive process in which molecules move from a region of higher concentration to a region of lower concentration.
15. It requires an expenditure of energy by the cell.
16. White blood cells engulf bacteria through what process?
17. receptor-mediated exocytosis
18. phagocytosis
19. exocytosis
20. pinocytosis
21. According to the fluid mosaic model of membrane structure, proteins of the membrane are mostly
    1. Free to depart from the fluid membrane and dissolve in the surrounding solution.
    2. Confined to the hydrophobic interior of the membrane.
    3. Embedded in a lipid bilayer.
    4. Randomly oriented in the membrane, with no fixed inside-outside polarity.
22. Which of the following would likely move through the lipid bilayer of a plasma membrane most rapidly?
23. Amino acid
24. CO2
25. K+
26. Glucos
27. The difference between pinocytosis and receptor-mediated endocytosis is that
28. Pinocytosis requires cellular energy, but receptor-mediated endocytosis does not.
29. Pinocytosis increases the surface area of the plasma membrane whereas receptor-mediated endocytosis decreases the plasma membrane surface area.
30. Pinocytosis is nonselective in the molecules it brings into the cell, whereas receptor-mediated endocytosis offers more selectivity.
31. Pinocytosis brings only water molecules into the cell, but receptor-mediated endocytosis brings in other molecules as well.
32. Which of the following processes includes all others?
33. diffusion of a solute across a membrane
34. passive transport
35. facilitated diffusion
36. osmosis
37. Which of the following membrane activities require energy from ATP hydrolysis?
38. Na+ ions moving out of a mammalian cell bathed in physiological saline
39. movement of carbon dioxide out of a paramecium
40. facilitated diffusion of chloride ions across the membrane through a chloride channe
41. movement of water into a cell
42. Water passes quickly through cell membranes because
43. it is a small, polar, charged molecule.
44. the bilayer is hydrophilic.
45. water movement is tied to ATP hydrolysis.
46. it moves through aquaporins in the membrane.
47. An organism with a cell wall would most likely be unable to take in materials through
48. phagocytosis.
49. osmosis.
50. diffusion.
51. active transport
52. In what way do the membranes of a eukaryotic cell vary?
53. Phospholipids are found only in certain membranes.
54. Only certain membranes of the cell are selectively permeable.
55. Certain proteins are unique to each membrane.
56. Some membranes have hydrophobic surfaces exposed to the cytoplasm, while others have hydrophilic surfaces facing the cytoplasm.
57. polysaccharides attached to the glycoproteins and glycolipids of animal cell membranes is
58. to actively transport molecules against their concentration gradients.
59. to facilitate diffusion of molecules down their concentration gradients.
60. to mediate cell-to-cell recognition.
61. to maintain membrane fluidity at low temperatures.
62. What kinds of molecules pass through a cell membrane most easily?
63. large polar
64. small and hydrophobic
65. large and hydrophobic
66. ionic
67. The process of the diffusion of water across a selectively permeable membrane is
68. Active transport
69. Osmosis
70. Pinocytosis
71. Endocytosis

40. -----------------is the process that cell uses to export bulky materials

1. Endocytosis
2. Exocytosis
3. Phagocytosis
4. Diffusion

41. Pinocytosis is a kind of

1. Exocytosis
2. Phagocytosis
3. Endocytosis
4. Active transport

42. the --------------- law of thermodynamics states that energy conversion increase the entropy of the universe.

1. first
2. second
3. third
4. fourth

43. --------------------is a series of chemical reactions that either catabolism or anabolism

1. thermodynamics
2. potential energy
3. kinetic energy
4. metabolism

44. ATP, is the energy currency of cells, consist of

1. adenine, pentose sugar, phosphate group
2. guanine, pentose sugar, phosphate group
3. adenine, pentose sugar, 3phosphate group
4. none of the above

45. An enzymes speeds up the chemical reaction by:

1. lowering the activation energy
2. raising the activation energy
3. reacting with the reactants
4. none of the above

46. Which of this factors effect on enzyme activity?

1. temperature
2. ph
3. cofactors
4. all of the above

47. Each enzyme has a particular target molecule called:

1. reactant
2. catalyst
3. active site
4. substrate

48. ------------------ inhibitor change shape of enzyme’s active site.

1. non-competitive
2. competitive
3. substrate
4. none of the above

49. Which of the following best describes the structure of a biological  
membrane?

1. two layers of phospholipids with proteins embedded between the two layers
2. a mixture of covalently linked phospholipids and proteins that determines which solutes can cross the membrane and which cannot
3. two layers of phospholipids with proteins either crossing the layers or on the surface of the layers
4. a fluid structure in which phospholipids and proteins move freely between sides of the membrane

50. An animal cell membrane will be more fluid at room temperature if it contains

* 1. more cholesterol.
  2. longer chain fatty acids.
  3. more unsaturated fatty acids.
  4. any of the above

51. Which of the following molecules will diffuse most quickly across a lipid bilayer membrane?

* 1. H2O
  2. O2
  3. Glucose
  4. Na+

**Photosynthesis part**

1. How are the light reactions and the Calvin cycle connected?
2. The light reactions provide ATP to the Calvin cycle, and the Calvin cycle provides NADPH for the light reactions.
3. The light reactions provide ATP and NADPH to the Calvin cycle, and the Calvin cycle returns ADP, Pi, and NADP+ to the light reactions.
4. The light reactions provide ATP and NADPH to the Calvin cycle, and the Calvin cycle returns reduced sugars to the light reactions.
5. The light reactions provide NADPH to the Calvin cycle, and the Calvin cycle provides RuBP to the light reactions.
6. Photosynthesis occurs in two stages
7. Light dependent reaction & Light independent reaction
8. Thylakoid & Mitochondria
9. Grana & stroma
10. Mitochondria &Cytoplasm
11. ----------- is NOT autotrophic?
12. Most plants
13. Protists
14. Fungi
15. Algae
16. The oxygen produced during photosynthesis comes from:
17. glucose
18. CO2
19. H2O
20. pyruvate
21. Carotenoids
22. Cause plants to look green
23. protect chlorophyll from excessive light
24. Play a role in photosynthesis
25. Help plants in cellular respiration
26. ------------- is not part of photosynthesis?
27. Calvin cycle
28. Glycolysis
29. Splitting of H2O molecule
30. Capturing of light energy
31. Photosynthesis is important because:
32. It begins all food chain
33. It makes oxygen gas
34. It makes glucose
35. All of the above
36. Which of the following occurs in the cytosol of a eukaryotic cell?
37. citric acid cycle
38. fermentation and chemiosmosis
39. oxidative phosphorylation
40. glycolysis and fermentation
41. In plant cell, leaves are
42. Responsible for storage
43. Responsible for photosynthesis
44. Responsible for support
45. None of the above
46. The net reaction of photosynthesis clearly shows that photosynthesis is \_\_\_\_\_\_.
47. An anabolic process
48. A catabolic process
49. An exergonic process
50. The cause for the greenhouse effect
51. The overall result of the light-reactions of photosynthesis is to
52. Synthesize glucose
53. Reduce water
54. Oxidize water
55. Convert the light energy to chemical energy
56. The overall result of the dark-reactions is to
57. Break glucose molecule to extract its chemical energy
58. The conversion of inorganic carbon to organic carbon
59. To oxidize water
60. To generate oxygen
61. The eukaryotic, photosynthetic organisms
62. Mitochondria is absent to prevent the respiration of sugars generated during photosynthesis.
63. Thylakoid membrane substitute for the presence of mitochondria
64. Both mitochondria and chloroplast are present in the cells, but their processes are tightly regulated
65. The chloroplasts can do both photosynthesis and cellular respiration.
66. Citric acid cycle reaction occur in
67. The cytoplasm
68. The inner membrane of the mitochondria
69. The hydrophilic compartment of the mitochondrial matrix.
70. Between the two membranes of the mitochondria: the inner membrane space.
71. Chemisosomosis occurs only in
72. Mitochondria
73. Thylakoid membranes
74. Both mitochondria and chloroplast
75. None of the above
76. Carbon dioxide enters a leaf through the
77. chloroplasts
78. mesophyll
79. thylakoids
80. stomata
81. Chlorophyll molecules are found in which part of the chloroplast?
82. grana
83. stroma
84. stomata
85. plasma membrane
86. Where the oxygen produced during photosynthesis comes from.
87. carbon dioxide
88. glucose
89. water
90. light
91. In photosynthesis, the oxygen atoms present in CO2 end up
92. as molecular oxygen and water
93. in water and carbon dioxide
94. as molecular oxygen and in sugar molecules
95. in sugar molecules and in water
96. Cellular respiration and photosynthesis are similar in that both involve
97. the production of sugars
98. redox reactions
99. the release of O2 into the atmosphere
100. the release of CO2 into the atmosphere
101. The most important role of pigments in photosynthesis is to
102. capture light energy
103. store energy in glucose molecules
104. release energy from glucose molecules
105. store energy in ATP
106. As photosynthesis occurs in chloroplasts, O2 is produced from \_\_\_\_\_
107. CO2
108. H2O
109. Glucose
110. Calvin cycle
111. The Calvin cycle is a series of reactions that \_\_\_\_\_.
112. assemble sugar molecules by fixing carbon
113. convert light energy to chemical energy
114. produce NADPH
115. produce ATP
116. The first stage of photosynthesis takes place in the……….
117. Thylakoids
118. Grana
119. Stomata
120. Stroma
121. Which of the following is not required during photosynthesis
122. Water
123. Carbon dioxide
124. Oxygen
125. Light
126. During what stage of photosynthesis is O2 produced?
127. Carbon fixation
128. Light – dependent reactions
129. Light – independent reactions
130. Calvin cycle
131. In the process photosynthesis
132. Carbon dioxide and water are oxidised
133. Carbon dioxide is reduced and water is oxidized
134. Carbon dioxide and water are reduced
135. Carbon dioxide is oxidized and water is reduced
136. Both carotenoids and chlorophyll are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
137. Coenzymes
138. Organelles
139. Pigments
140. Cofactors
141. ATP is ………………
142. required for the Calvin cycle
143. a product of the Calvin cycle
144. required for the light reactions
145. not required during photosynthesis
146. In the light reactions, solar energy is converted to chemical energy stored in both ATP and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
147. AMP
148. ADP
149. NADPH
150. NADH
151. The Calvin cycle occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the chloroplast
152. Stroma
153. Stoma
154. Thylakoid
155. The inner mitochondrial membrane
156. Photosynthesis is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_reaction.
157. Exergonic
158. Endergonic
159. a & b
160. None of the above
161. In the leaf, chloroplasts are concentrated in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
162. Epidermis
163. Veins
164. Mesophyll
165. Thylakoids
166. In the leaf, the CO2 enters and the oxygen released through\_\_\_\_\_\_\_\_\_\_\_\_\_\_
167. Stroma
168. Stoma
169. Granum
170. Epidermis
171. Plants are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
172. Autotrophs
173. Prototrophs
174. Heterotrophs
175. Auxotrophs
176. The oxygen released during photosynthesis comes from:
177. Carbon dioxide
178. Carbon dioxide and water
179. Water
180. Glucos
181. What energy-rich organic compound is produced as a result of the Calvin cycle?
182. ATP
183. Sugar
184. NADPH
185. O2
186. The chloroplast is the site of photosynthesis in a plant cell. It is enclosed by \_\_\_\_\_\_ membranes.
187. One
188. Two
189. Three
190. Four