Cell Transport Test Review Answer Sheet

Someone who is not currently answering a question should hold this paper and inform all persons of the correct answer after the "victim" has tried to do so. Pass the paper on to the next person at each turn!

1. B) Carbohydrate
2. Plasma membrane
3. Phosphate
4. Fatty Acid
5. A) Phospholipid Bilayer
6. C) Phospholipid
7. Hydrophilic = Water-loving
8. Hydrophobic = Water-fearing or Water-hating
9. B) the fatty acids are hydrophobic
10. Cholesterol
11. Phospholipids consist of one phosphate group and two fatty acids.
12. Two layers of phospholipids (hence the term: phospholipids bilayer)
13. Fluid Mosaic Theory of Plasma Membranes = "proteins float in a fluid consisting of a phospholipids bilayer. The proteins and phospholipids both are able to move around."
14. The phosphate group is polar (able to form a charge).
15. The fatty acids are nonpolar. They can't form a charge because they consist mainly of carbon & hydrogen atoms.
16. Enzyme
17. Self ID Marker
18. Cholesterol
19. Channel Protein
20. Cell Surface Receptor
21. Phosphate Group
22. Fatty Acid
23. Nonpolar = not able to form a charge because it consists mostly of carbon and hydrogen atoms
24. Polar = able to form an electrical charge due to the oxygen atoms it contains.
25. Fluid Mosaic Theory of Plasma Membranes = "proteins float in a fluid consisting of a phospholipids bilayer. The proteins and phospholipids both are able to move around."
26. Glycoproteins are proteins with carbohydrate components which help identify a cell as friend or foe.
27. It is an advantage to have enzymes on membranes because it helps organize chemical reactions to occur more efficiently.
28. Enzymes help catalyze chemical reactions that normally wouldn't occur quickly at body temperatures. They lower the activation energy needed to allow the reaction to occur quickly.
29. Self ID Marker Protein
30. Self ID marker proteins identify a cell as belonging to an organism or not. They identify a cell as friend or foe.
31. Channel proteins allow ions that fit a lock & key "gate" to pass through to the inside of a cell.
32. Cell surface receptor proteins fit to large molecules via lock and key fit. They then help bring the large molecule into the cell.
33. Hydrophilic = water-loving
34. Hydrophobic = water-fearing or water-hating
35. Water simply passes through the gaps between phospholipids in the phospholipids bilayer.
36. Adhesion Proteins
37. Passive transport requires no energy to occur and always occurs from high concentration to low concentration. Active transport does require energy to occur because it is trying to move molecules from low to high concentration.
38. The Na-K pump is an example of active transport because a) it requires energy and b) it moves both the Na^+ (sodium) and K^+ (potassium) from low to high concentration.
39. In the sodium-potassium pump, **3** Na+ leave the cell for each **2** K+ that enter the cell.
40. Plasma membrane
41. The movement of any molecule or atom from an area of high concentration to an area of low concentration.
42. Osmosis = the diffusion of water across a membrane from high concentration to low concentration.
43. Passive transport = movement from high to low concentration.
44. Water moves into the cell (98% water outside cell, while 5% salt =95% water), so water moves from 98% to 95%.
45. During exocytosis, a vacuole moves from the cytoplasm to touch the plasma membrane. The membrane of both the vacuole and plasma membrane join. The vacuole then squeezes its contents out of the cell as the vacuole membrane becomes part of the plasma membrane.
46. Facilitated diffusion = a type of passive transport where a molecule (usually a macromolecule like sugar) is carried across the membrane by a cell surface receptor protein from high to low concentration.
47. Active transport = movement of molecules from low to high concentration across a membrane, a process that requires energy!

48. Active transport is different from passive transport in that it needs energy and moves molecules from low to high concentration. Passive transport needs no energy and moves molecules passively from high to low concentration.
49. A slug dies when placed in salt water because in salt water, there is less water outside the slugs cells than inside them. Water thus moves out of the slug and its cells dehydrate.
50. Water will flow out of the cell. (5% salt = 95% water.) 95% is higher than 90%, so water moves from 95% inside the cell to 90% outside the cell.
51. Endocytosis is a form of active transport that needs energy to occur. Molecules move into the cell, from low to high concentration when the plasma membrane folds inwards, capturing some of the molecules. The membrane eventually forms a vacuole around the molecules. The vacuole then moves into the cytoplasm.
52. Water flows into and out of the cell equally. (75% water = 25% sugar) Because both the cell and surrounding solution contain 75% water, water moves in both directions at an equal rate.
53. Semipermeable membranes are barriers with holes or pores in them that are small enough to keep large molecules from passing through, while small molecules pass through easily.
54. Phagocytosis is one type of endocytosis. It is also a type of active transport. Large particles or cells are brought into the cell, from low to high concentration when the membrane folds inwards, surrounding the cell, eventually forming a vacuole that can then move into the cytoplasm.
55. Osmosis
56. Water flows out of the cell (96% water inside the cell is greater than 90% outside)
57. Water flows in and out of the cell equally. (A 5% salt solution = 95% water.) The water concentration is thus 95% both in and out of the cell.
58. Into the cell. 15% salt = 85% water. There is thus less water inside the cell, so it moves into the cell from 90% to 85%.
59. The cell cytoplasm is hypotonic to the surrounding solution. (Inside the cell, 96% water = 4% solute. Outside, 90% water = 10% solute. There is less solute inside the cell, so it is thus hypotonic. HINT: Hypo = less!)
60. The cell cytoplasm is hypertonic to the surrounding solution. (Outside the cell, 90% water = 10% solute. There is more solute inside the cell, so it is hypertonic. HINT: Hyper = more!)
61. The cell cytoplasm is isotonic. (95% water = 5% solute. The concentration of solute in and outside the cell is thus the same. Hint: ISO = the same or equal.)
62. The cell cytoplasm is hypotonic. 90% water = 10% solute. 10% > 5%, so there is less solute inside the cell.
63. Isotonic. 75% water = 25% sugar. Both solutions, the cytoplasm and surrounding solution are equal.
64. Cells remain small in size because as they get larger, the cell volume gets larger faster than the surface area of the surrounding plasma membrane. At some point, the volume is too larger for the surface area to provide oxygen and food to keep such a large cell alive!
65. As cell volume increases, the membrane surface area also increases. But the volume increases much faster than that of the surface area.
66. The phosphate group of the phospholipids is water loving (hydrophilic).
67. The 2 fatty acids of the phospholipids is water fearing (hydrophobic).
68. Hypertonic means one solution contains more solute (like salts or sugars) than another solution it is being compared to.
69. Hypotonic means one solution contains less solute (like salts or sugars) than another solution it is being compared to.
70. Isotonic means that two solutions that are being compared contain equal concentrations of solutes.
71. In simple diffusion, atoms or molecules move from high to low concentrations, either without passing through a membrane, or by being small enough that they can pass through small holes in the membrane. With facilitated diffusion, atoms and molecules pass through a membrane from high to low concentration by being carried through the membrane by a cell surface receptor protein.
72. a) Cotransport is a form of active transport, requiring energy to move molecules from low to high concentration. B) Typically this consists of a proton (hydrogen ion) being pumped out of a cell. C) As the proton reenters the cell, it's energy helps bring a macromolecule (like glucose or sucrose) into the cell with it.
73. Exocytosis (the vacuole is moving out of the cell.
74. Isotonic. The arrows are pointing both into and out of the cell indicating the concentrations are the same inside and out of the cell.
75. Endocytosis (Pinocytosis is also acceptable here since the molecules are small.) The vacuole is moving into the cell.
76. It is a type of endocytosis called phagocytosis. A large molecule or cell is being brought into the cell by a vacuole.
77. Pinocytosis is a type of endocytosis that has a vacuole form around liquids on the plasma membrane. The vacuole then brings the liquid into the cell cytoplasm.
78. Sodium-potassium (Na-K) pump. Note the K+ and Na+ and ATP.
79. The cytoplasm is hypotonic. Water is leaving the cell (see arrows), so there is more water inside the cell, which means there would be less solute there. Less solute = hypotonic.
80. ATP (**A**denosine **T**ri**P**hosphate) provides energy for membranes to do active transport.
81. The cytoplasm is hypertonic. Water is entering the cell, meaning there is less water or more solute there. More solute = hypertonic.
82. Proton Pump or Hydrogen Pump (note the H+ as well as the ATP.)
83. Active transport. A) H+ is moving from low concentration to high concentration. B) ATP is involved (See bottom of diagram.)

84. Cotransport. H+ is actively transported out of the cell. As it moves back into the cell, it brings glucose with it.