

Physio ex 9.0 essay



**ASSIGN
BUSTER**

ACTIVITY 1: Simulating Dialysis (Simple Diffusion) Answers 1. The molecular weight of urea is approximately 60. Which of the membranes can it pass through? a. 50 MWCO membrane b. 100 MWCO membrane c. 200 MWCO membrane d. Both the 100 and 200 MWCO membranes D. Both the 100 and 200 MWCO membranes 2. True or False: A solution containing glucose will diffuse faster through a 200 MWCO membrane if it is heated. True 3. The molecular weight of carbon C is 12; the molecular weight of hydrogen (H) is 1; the molecular weight of oxygen (O) is 16.

The chemical formula of glucose is: $C_6H_{12}O_6$. Using some simple multiplication and addition, determine the molecular weight of one molecule of glucose. 4. Describe two variables that affect the rate of diffusion. 5. Why do you think that the urea was not able to diffuse through the 20 MWCO membrane? 6. Describe the results of the attempts to diffuse glucose and albumin through the 200 MWCO membrane. 7. Put the following in order from smallest to largest molecular weight: glucose, sodium chloride, albumin, and urea. ACTIVITY 2: Simulated Facilitated Diffusion Answers . True or False: The facilitated diffusion of glucose requires energy from ATP. 9. Which of the following might cause the facilitated diffusion of glucose from one solution to another to occur faster? a. Add Na^+Cl^- to the beaker on the left. b. Add K^+Cl^- to the beaker on the left. c. Add ATP to the beaker on the left. d. None of these would cause it to happen faster. 10. True or False: If there are a sufficient large number of transport proteins present, glucose can be transported from a solution of lower concentration to a solution of higher concentration (i. e. p its concentration gradient.) 11. Explain one way in which facilitated diffusion is the same as simple diffusion; one way in which it

is different. 12. The larger value obtained when more glucose carriers were present corresponds to an increase in the rate of glucose transport. Explain why the rate increased. 13. You were asked to predict what effect you thought that adding Na^+ Cl^- would have on the glucose transport rate. Why did you pick the choice you did? How well did the results compare with your prediction? ACTIVITY 3: Simulating Osmotic PressureAnswers 14.

True or False: Osmosis is considered a type of passive transport, i. e. it does not need energy from ATP. 15. If a cell is placed in a _____ solution of water, there will be no net movement of water in or out of the cell. a. hypotonic b. isotonic c. hypertonic 16. If you “ cut” the concentration of a non-diffusible solute that is on one side of a membrane in half, the osmotic pressure will a. double. b. not change. c. be half of what it was before. 17. Explain the effect that increasing the Na^+ Cl^- concentration had on osmotic pressure and why it has this effect. 8. Describe one way in which osmosis is similar to simple diffusion; describe one way in which it is different. 19. Solutes are sometimes measured in milliosmoles. Explain this statement: “ Water chases milliosmoles. ” 20. The conditions were 9mM albumin in the left beaker and 10mM glucose in the right beaker with the 200 MWCO membrane in place. Explain the results. ACTIVITY 4: Simulating FiltrationAnswers 21. The filtration rate of Na^+ Cl^- in the simulation was dependent on a. the pore size of the membrane. b. the hydrostatic pressure applied to the top beaker. c. the concentration of the solutes in the lower beaker. d. both the pore size and the hydrostatic pressure applied. 22. True or False: The simulation would not function if the top beaker were open to the atmosphere instead of having pressure applied to the top beaker. 23.

Explain in your own words why increasing the pore size increased the filtration rate. Use an analogy to support your statement. 24. Which solute did not appear in the filtrate using any of the membranes? 25. Why did increasing the filtration pressure increase the filtration rate but not the concentration of solutes? **ACTIVITY 5: Simulating Active Transport** Answers

26. In this simulation, each of the following was (were) required in order for active transport to occur: a. sodium ions (Na^+) b. potassium ions (K^+) c. energy from ATP d. All of the above were required. 27. True or False: The amount of ATP that you dispensed did not affect the rate that the solutes passed from one beaker to the other. 28. Which of the following processes require ATP? . Simple diffusion b. Facilitated diffusion c. Filtration d. Osmosis e. Active transport 29. Describe the significance of using 9mM sodium chloride inside the cell and 6mM potassium chloride outside the cell. 30. Explain why there was no sodium transport even though ATP was present. 31. Explain why the addition of glucose carriers either had no effect or did have an effect on sodium or potassium transport. 32. Do you think glucose is being actively transported or transported by facilitated diffusion in this experiment. Why?