Worksheet 17 – CHEM 121 – Fall 2015

Monday Name: _____

Wednesday Name: _____

Directions: Bring this worksheet completed, 100%, with you to class tomorrow evening. Be prepared to go to the board on this worksheet and the previous worksheet.

1) Explain Bernoulli's Law.

2) Draw a diagram to explain Bernoulli's Law in the space below – be sure to label it.

3) Describe how an aspirator pump works.

4) Draw a diagram to explain how an aspirator pump works in the space below – be sure to label it.

5) Describe the dependency of Re on V, d, ρ and η. Be sure to use the detailed formula for determining the Reynolds number.

6) What is the significance of the Reynolds number?

7) Describe the dependency of the resistance of blood flow on the radius of the pipe, tube or blood vessel.

#8	#9	#10
R_1 = 7 units	R_1 = 2 units	R_1 = 1 unit
R_2 = 10 units	R_2 = 4 units	R_2 = 2 units
R_3 = 12 units	R_3 = 6 units	R_3 = 3 units
	R_4 = 8 units	R_4 = 4 units
		R_5 = 5 units

8, 9 and 10) Based on the above table, determine under which conditions you would have the greatest flow: vessels in series or in parallel.

11) Define Pascal's Law.

12) Using your own words, explain how amniotic fluid can both protect and injure a developing fetus. An illustration of your own would be helpful (remember: this isn't an art class!).

13) Draw a picture/diagram of a Fisher burner and explain how the Venturi effect works in it.

14) Define laminar flow of fluids. Give an example of laminar flow.

15) Define turbulent flow of fluids. Give an example of turbulent flow.

16) Explain how Poisueille's Law impacts blood pressure and the treatment for blood pressure.

17) In the old days (yes, even before I was born), miners used hydraulics to wash away mountain sides to obtain precious metals and/or mineral ores. This was accomplished by using multiple pipes of varying diameters, starting with huge diameters and ending with small diameters. Using your knowledge of electricity and fluid dynamics, draw and explain how you'd do that using a water reservoir, focusing ONLY on resistance to flow (i.e., don't get hung up on other "stuff"), if you started your pipes in series with a large pipe diameter (R = 10 RU) and end with a small pipe diameter (R = 100 RU). You'll have to have other diameters in between the two. Your final R should be 1470 RU. Label the R of each pipe and draw your pipes to approximate scale – while you ought to draw the pipes in a downward fashion, ignore the effects of gravity.

18) According to Poisueille's Law, if a patient takes antihypertensive medication and it reduces the resistance to the flow of blood, all other variables notwithstanding, what's the net effect on the patient's blood pressure?

19) Draw your own graphic to explain how LaPlace's Law is followed by alveoli with and without surfactant when a person breathes. Be sure to label the graphic.

20) Draw your own graphic to explain how Fick's Law is followed by semi-permeable membranes to facilitate gas diffusion across the semi-permeable membrane. Be sure to label the diagram.