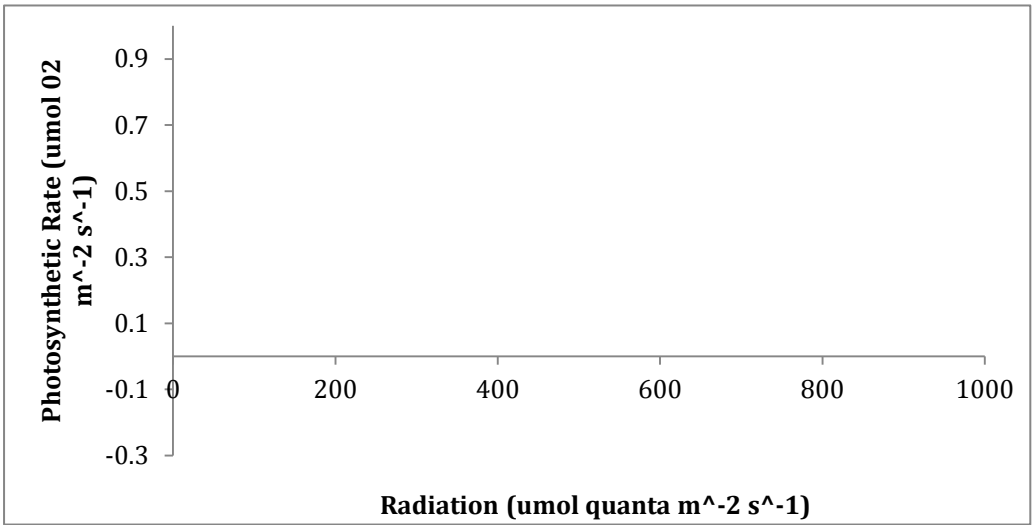
Name: _____ Bio 372 Lab Final Quiz (60 pts)

1) What is your section number? What is your TA's name? (2.0 pts)

2) What instrument did we use in lab to measure wind speed and what are the SI units for wind speed (2.0 pts)?

3) What does a sling psychrometer measure? What are the units? (1.0 pt)

4. As described in lab, **label and draw** the theoretical photosynthetic output to a light response curve for **both** a **sun-** and **shade-adapted plants**. Please indicate where the **Basal Metabolic rate (BMR)** and $\mathbf{P_{max}}$ can be determined on this graph for <u>each</u> type of plant. (4.0 pts)



5. Community A has 10 species and a Shannon Diversity Index (H') = 3.36, while Community B has 16 species and H' = 1.75. Which community is more diverse and which community is more species rich? (2.0 pts)

More Diverse: More Species Rich:

6. In a hypothetical community, you conduct vegetation sampling by measuring canopy coverage in ten plot frames along a transect. Below is reported the coverage values for two species, *Bromus tectorum* and *Draba verna*, in each plot frame. What is the frequency of each species along this transect? (2.0 pts)

Plot	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Frequency**
Bromus tectorum	0	2.5	2.5	37.5	0	0	2.5	25	0	50	
Draba verna	2.5	0.25	0	37.5	15	0	2.5	37.5	2.5	0	

7. With information you learned from the oxygen bomb lab, approximately how much energy would a cow utilize from a bunch of grass with a total caloric value of 10 kcal? Explain your answer. (2.0 pts)

8. Specify why scientists must differentiate between '**seed removal**' and '**seed predation**.' (4.0 pts)

9. In a simple lake system where green algae, *Daphnia*, and Alewife are the only organisms in the lake and each trophic level feeds only on the trophic level below it (i.e. no omnivory), what are two short-term outcomes you might expect from an external introduction of many *Daphnia* into the lake and why could each happen (6.0 pts)

10. Describe the difference between a density series and a replacement series. Make sure to identify the type of competition (interspecific vs. intraspecific competition) it best tests. (4.0 pts)

11. Provide a characteristic of pollen that makes it a useful tool for paleocommunity studies. (2.0 pt)

12. What is one disadvantage of using pollen studies to study paleocommunities? (2.0 pts)

13. Please complete the rest of the blanks in this static life table (4.0 pts).

Ax	Dx	# of dead	Nx	Survivorship (lx)
0 - 1	1	250		
1.1 - 3	2	68		
3.1 - 5	2	57		
5.1 - 10	5	38		
10.1 - 15	5	15		

No = _____

14. For each of the following equations, please **identify** which of the models of population growth are described and draw a **graph** of the expected growth pattern described by each equation. Make sure to **label axes**. (6.0 pts.)

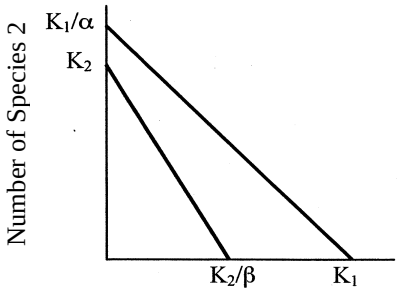
A. $N_t = N_0(rm*t+1)$

B. $N_t = \frac{K}{1+e^{a-rm*t}}$

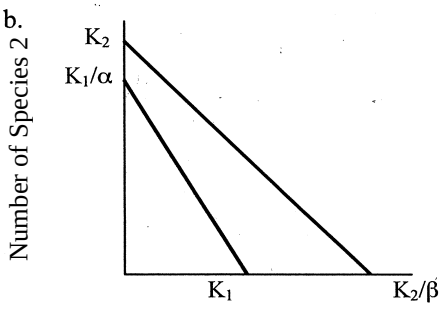
C. $N_t = N_0 e^{rm*t}$

15. For each component below (a-d), identify the winning species or whether the system is at equilibrium. If the system is in equilibrium, indicate if the equilibrium is stable or unstable. (4.0 pts)

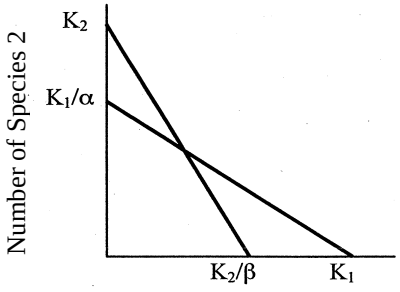
a.



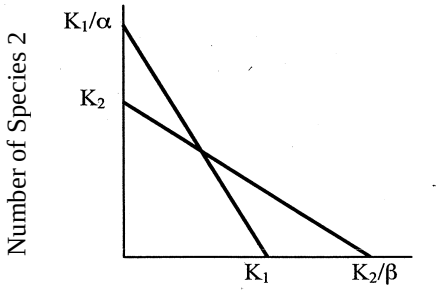
b.



c.



d.



a. _____ b. _____

c. _____ d. _____

16. Define the term "limiting nutrient" and describe a concise example of this phenomenon from a lab simulation experiment conducted this semester in lab. Make sure to identify (broadly) the focal organism and the major limiting resource. (4.0 pts)

Limiting Nutrient:

19. What is the vector of WNV infection in humans and what two primary abiotic factors influence the occurrence of the disease? (3.0 pts.)

20. As a wheat farmer, propose two techniques you could use to reduce CO_2 emissions during cultivation; make sure to note how each of these changes will alter your overall yield. (6.0 pts.)