Directions: In the space provided, answer in well-organized sentences and paragraphs, unless otherwise noted. This is your last chance to demonstrate you understand the inter-relationship of details and concepts. (Note point values.)

1. Choose any system (except the kidney) we have discussed this academic year and demonstrate your understanding of the activation of inactive precursors such that a chemical change to a protein causes a series of events. Clearly give an overview of the process. (5)

2. Demonstrate your understanding of the importance of sodium by choosing and then explaining two different examples of sodium playing a key role in physiology—one choice must be sodium and the kidney. (15)
   a)
   b)

3. Choose two different anatomical/physiological systems and demonstrate the extreme importance of surface area—one choice must be the digestive system. (10)
   a)
   b)
4. Choose any renal buffering system and draw a compartmental flow chart demonstrating the interaction of the hydrogen and bicarbonate ion. In sentence format, summarize your flow chart to show me you understand the role of kidney physiology in acid base balance. (10)

5. Choose either the renal corpuscle or nephron loop (Loop of Henle!) and discuss the interrelationship of the histology and the function. How does your choice contribute to the formation of urine? (15)
6. Use the graphs to demonstrate your understanding of a transport maximum, our glucose tolerance laboratory results, uncontrolled Diabetes Mellitus, role of insulin, and the proximal convoluted tubule. (15)

7. Use the renin system to explain long-term blood pressure control, activation of inactive precursors, and interaction of hormones and blood values on other hormones. (15)
8. What is the daily glomerular filtration rate if urine flow is 1.1 ml/min, Plasma creatinine is 1.05mg/ml, and urine creatinine concentration is 134mg/ml? Briefly describe why plasma clearance of creatinine is a good marker for GFR. (5)

9. List three functions of the liver. Describe how the anatomical placement of the liver and its histology contribute to its key roles in the body. (10)
   a)
   b)
   c)

I hope you enjoyed your stay in Bair 104 this year...for my part, I did. Have a safe and happy summer. I will have these exams ready for pick up by noon on Wednesday—outside Bair 101B.