Name _____

Chem 352 - Fall 2013
Quiz 3

1. There are 28 serine residues in the serine protease α-*chymotrypsin*, but only one, the serine located at position 195 in the polypeptide's amino acid sequence, reacts rapidly when the enzyme is treated with the irreversible inhibitor diisopropyl flurophosphate (DFP).
   a. Explain why this particular serine residue, among all those in the enzyme, is the most reactive to DFP.

   b. In class we describe four modes of enzyme catalysis, two catalytic modes and two binding modes. Which of the four modes does serine-195 provide an example for in the reaction catalyzed by α-chymotrypsin.

   c. Which of the four modes does histidine-57 provide an example for in the reaction catalyzed by α-chymotrypsin.

   d. Using structural formulas, write a balanced chemical equation for the reaction catalyzed by α-chymotrypsin.

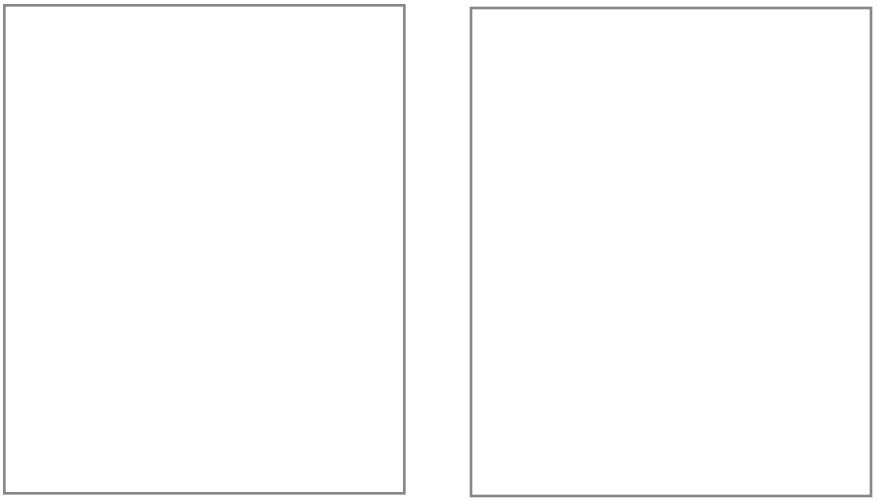
   e. Is the substrate ordering for this enzyme catalyzed reaction *ordered sequential*, *random sequential*, or *ping-pong sequential*? _____
   Explain:

   f. Describe the substrate specificity exhibited by α-chymotrypsin?

2. In class we discussed how monosaccharides can be classified by the number of carbon atoms they contain along with whether they contain a *ketone* or and *aldehyde* group.
   a. For each of the classes of monosaccharide indicated, complete the following table:

Class	Carbonyl-containing Group	Empirical Formula for Members of this Class	Number of stereoisomers for the open-chain form
Aldohexose			
Aldopentose			
Ketohexose			
Ketotriose			

   b. Draw the Fischer projections for the open-chain forms of the D-*isomer* for two *aldohexoses* of your choice, which are *epimers* of one another



   c. Name each of your choices.

_____ _____

   d. Using Haworth projections, draw the α-*anomer* of the disaccharide formed by connecting the monosaccharide shown above on the left, to the one shown on the right, using a β(1-4) *glycosidic bond*.

   e. Is the disaccharide you have drawn a *reducing sugar*? _____