

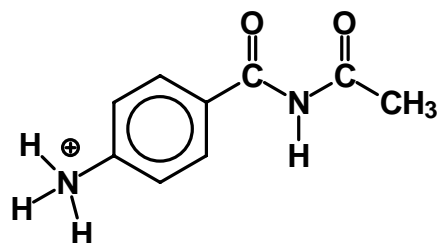
ORGANIC MEDICINAL CHEMISTRY  
 MEDC 501, Fall Semester, 2002  
 Exam #1, Part A (Dr. Soine, 50 points); September 18, 2002

PLEDGE \_\_\_\_\_  
 (signature)

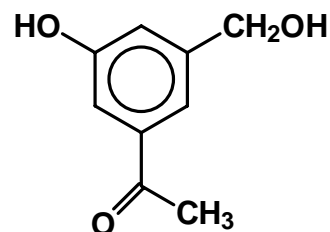
NAME \_\_\_\_\_  
 (print)

1. Circle the proton in each structure that has the lowest pKa (ie. the strongest acid).  
 (2 points each structure)

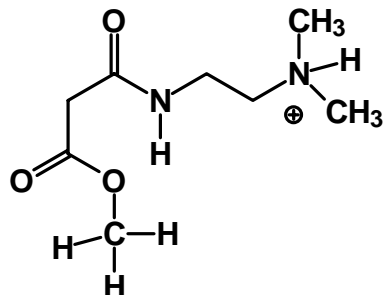
A.



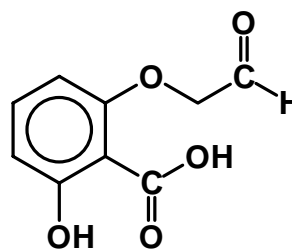
B.



C.

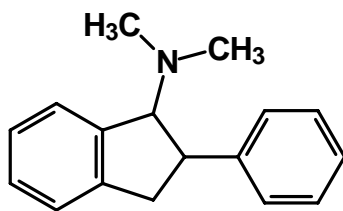


D.

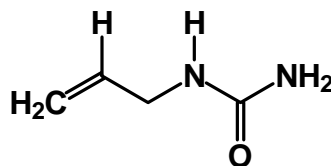


2. Give the approximate pKa for each of the following compounds. If the compound has more than one pKa, indicate the acidic or basic functional group associated with each pKa. If the compound is neutral, ie. no group that can be protonated or deprotonated in an aqueous solution, indicate with an N. (2 points each structure).

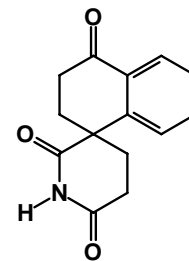
A. \_\_\_\_\_



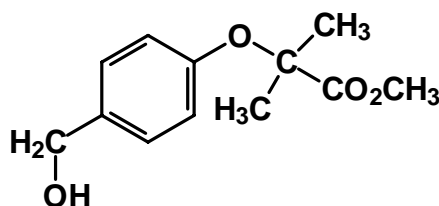
B. \_\_\_\_\_



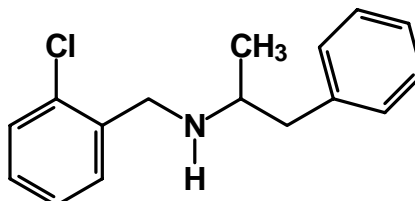
C. \_\_\_\_\_



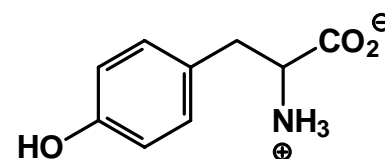
D. \_\_\_\_\_



E. \_\_\_\_\_



F. \_\_\_\_\_

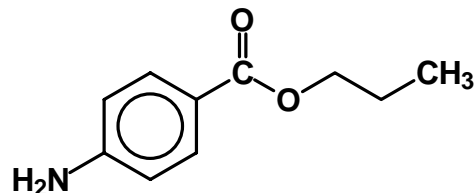
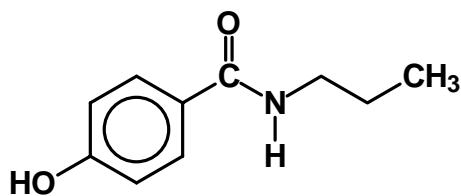


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3. Indicate if the following compounds would exist primarily in ionized or unionized form at pH 7. (3 points, circle correct answer)

A. ionized, unionized

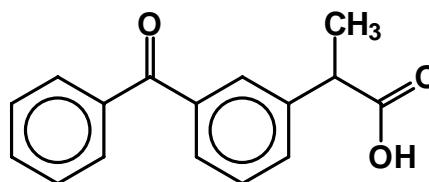
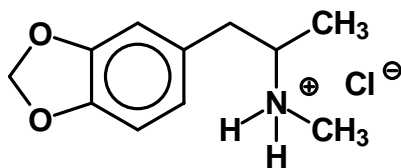
B. ionized, ionized



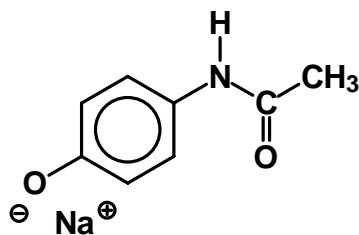
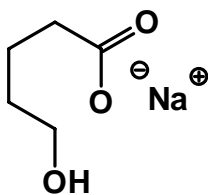
4. For each of the following compounds (using the structure drawn), indicate if it will act as a weak acid or a weak base. (3 points, circle correct answer)

A. weak acid, weak base

B. weak acid, weak base

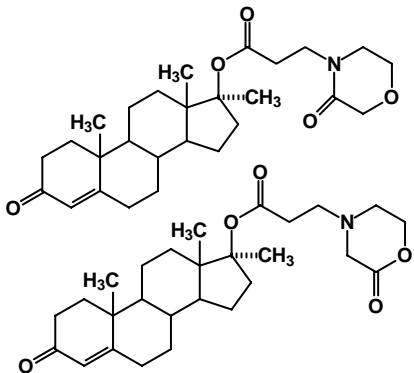


5. The pH of the kidney can range from 4.5 to 8.0. Which of the two compounds shown below will be most rapidly excreted at pH 8. (Circle the appropriate compound, 2 points) Why? (4 points)



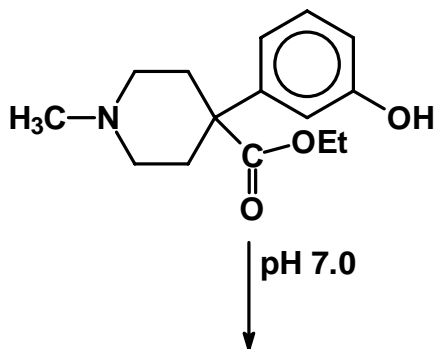
Name \_\_\_\_\_

6. You are asked to prepare an intravenous (IV) solution of methyltestosterone. Methyltestosterone has very poor water solubility. Therefore you need to use one of the two methyltestosterone derivatives (prodrug) shown below. Which of the prodrugs would be used so that you would get a clear solution suitable for IV administration? (2 points, circle correct answer) What pH would you need to buffer the IV preparation to make sure it would go into solution? (2 points) Why? Explain using structures (2 points)



7. Draw the dominant structure of each compound shown below at pH 7.0 (3 points each structure)

A.



B.

