

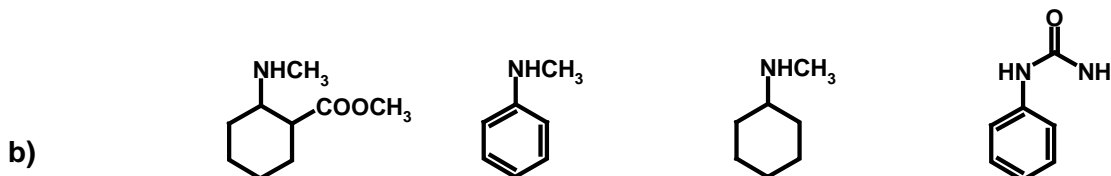
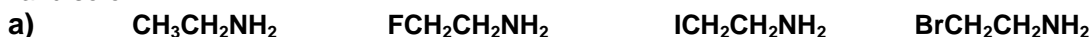
**BASIC PHARMACEUTICAL SCIENCE FOR THE PRACTICING PHARMACIST
MEDC 527, Fall 2008**

Quiz #2, Dr. Desai, 100 points; September 18, 2008

	IV	V	VI	VII
2	C	N	O	F
3	Si	P	S	Cl
4	Ge	As	Se	Br
5				I

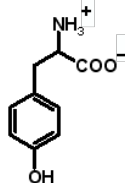
STUDENT NAME (in CAPITAL Letters ONLY)	VCU ID #
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1. Rank the molecules/ions in each series according to their basicity. Use 1 for the least basic, 2 for slightly higher, and so on. (16 pts)

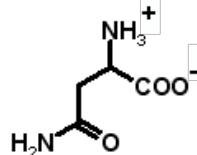


2. Draw clearly the structures of the following two amino acids in their appropriate charge state at pH 7.0. (12 pts)

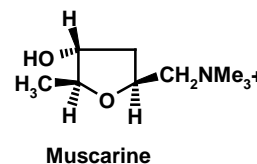
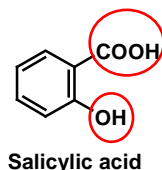
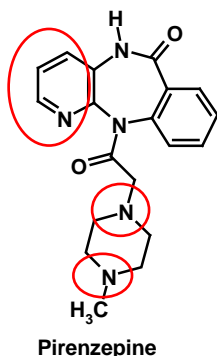
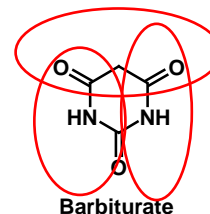
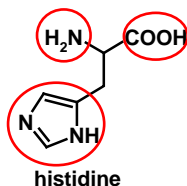
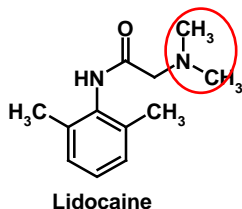
1) Tyrosine



2) Asparagine



3. Circle ionizable functional group(s) (pH range 0 -14) in the following molecules and indicate their approximate pK_A value or range. If there are no ionizable groups, write NONE. (11 pts)



4. Define the following terms in not more than 3 sentences.

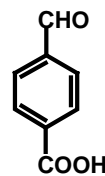
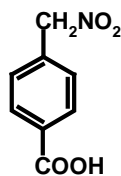
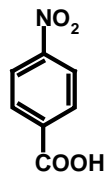
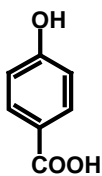
(10 pts)

1) Inductive Effect: _____

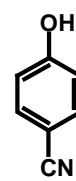
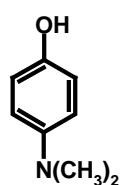
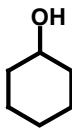
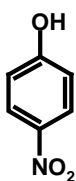
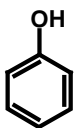
2) Aromaticity: _____

5. Rank the molecules/ions in each series according to their acidity. Use 1 for the least acidic, 2 for slightly higher, and so on. (32 pts)

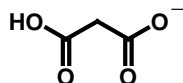
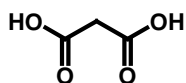
a)



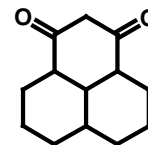
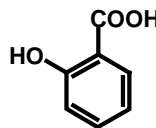
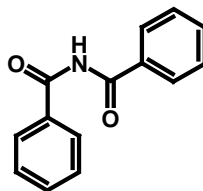
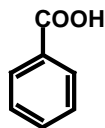
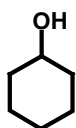
b)



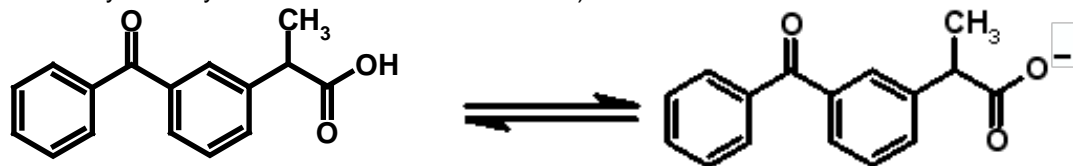
c)



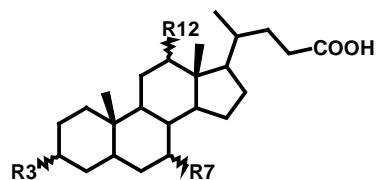
d)



6. You have been asked to prepare a fine syrup containing ketoprofen (structure below) as the active anti-inflammatory ingredient. In your pharmacy there are several natural and unnatural syrup choices, e.g., cherry (pH 4) or orange (pH 2), banana (pH 7), and man-made syrup (pH 10). Which syrup would you choose? (2 points) Why? Explain using appropriate structures. (4 points for structures; 4 points for succinct explanation on why would you choose one over the others). (10 pts)

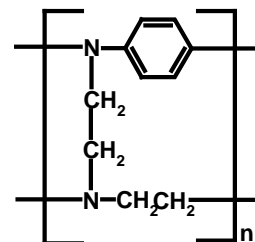
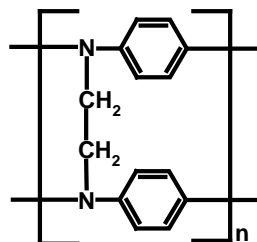
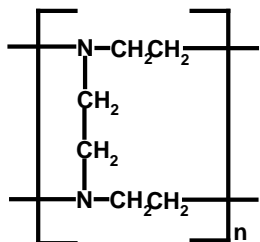


7. Bile Acid Sequestrants (BAS) are agents that reduce the absorption of bile acids from the stomach/intestine and thereby reduce the serum levels of cholesterol. They form an important strategy to reduce high 'bad' cholesterol in blood. They work by binding the carboxylate anion (RCOO^-) of bile acids. The structure of bile acids is as shown below. For the following potential BAS use your knowledge of pKa values, acidity/basicity of functional groups and chemical bonding to rank their effectiveness (i.e., greater ability to bind carboxylate anions) as they pass through the intestine. Use 1 for most effective, 3 for least. (9 pts)



Bile Acids

R3, R7 and R12 may be H or OH



Order of effectiveness here: _____
