

BASIC PHARMACEUTICAL SCIENCE FOR THE PRACTICING PHARMACIST

MEDC 527, Fall 2008

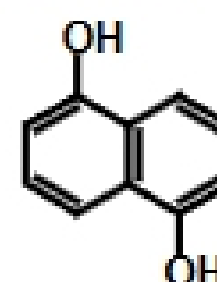
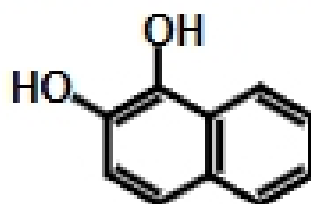
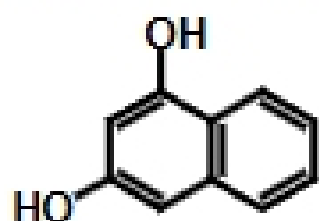
Quiz #1, Dr. Desai, 100 points; September 9, 2008

STUDENT NAME (in CAPITAL Letters ONLY)

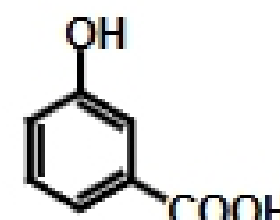
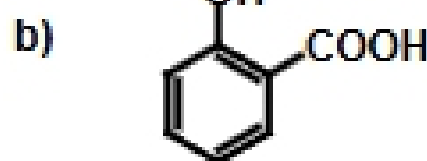
VCU ID #

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

1. Rank the molecules according to their expected mp/bp. Use 1 for least and 3 for highest mp/bp. (6 pts)



2. Circle the molecule in the pair that is expected to have higher boiling/melting point. (8 pts)



3. Write the Henderson – Hasselbach equation for the following equilibrium. Define the terms involved. (12 pts)




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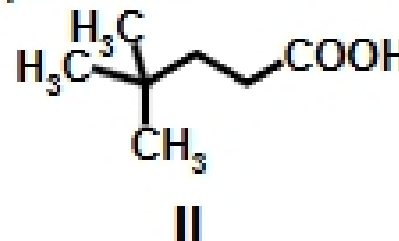
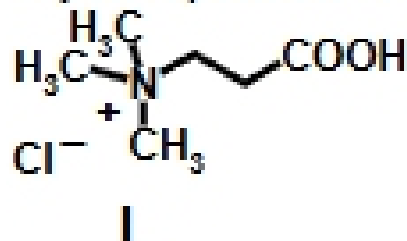


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4. In few sentences, explain why I is expected to have lower pKa than II. (6 pts)




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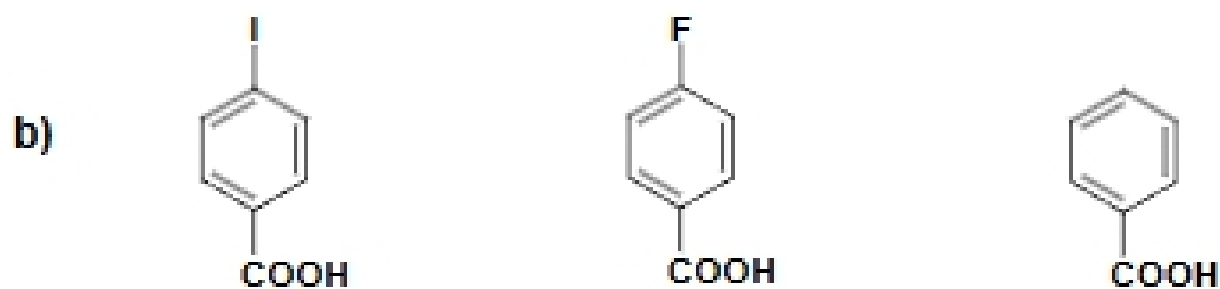
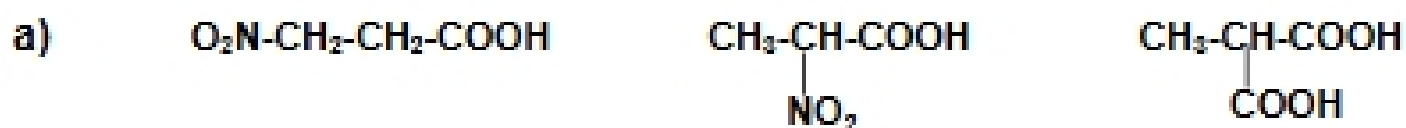


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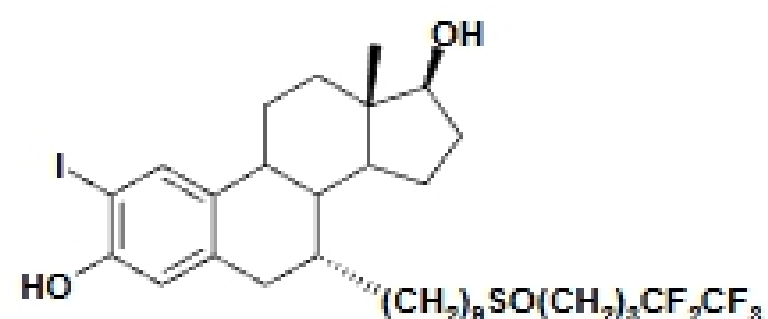


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5. Rank the molecules/ions in each series according to their pKa values. Use 1 for the least pKa value, 2 for the next higher and so on. (18 pts)



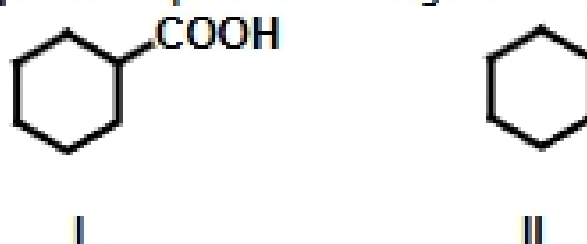
6. The molecule underneath is potential diagnostic marker for an anti-estrogenic agent. Indicate the Kier-Hall electronegativity values of the following atoms. (8 pts)



Kier-Hall eN Value

-O- of phenolic OH = \_\_\_\_\_  
 I- = \_\_\_\_\_  
 S = \_\_\_\_\_  
 F of CF<sub>2</sub> = \_\_\_\_\_

7. In few sentences, explain why the bp of I is expected to be higher than that of II. (6 pts)




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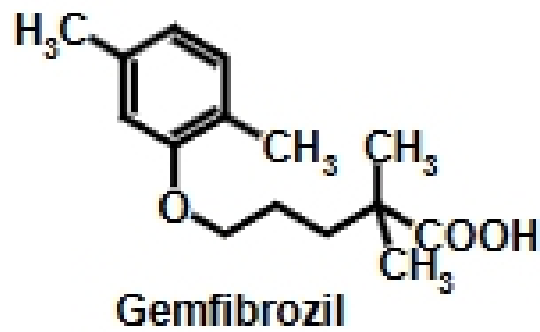
8. Amyl nitrite is a nitrovasodilator. The structure of amyl nitrite is  $(\text{CH}_3)_2\text{CHCH}_2\text{CH}_2\text{-O-N=O}$ . Write the electronic structure of its nitrogen and the double bonded oxygen atoms and indicate their hybridization states. (8 pts)

The electronic structure of N is \_\_\_\_\_  
 The hybridization state of N is \_\_\_\_\_

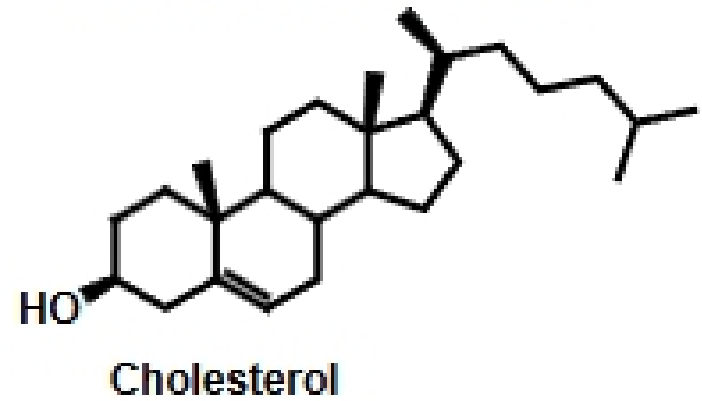
The electronic structure of =O is \_\_\_\_\_  
 The hybridization state of =O is \_\_\_\_\_

9. Indicate whether the following drugs or biological molecules will exhibit good water solubility at pH 7.2-7.4. Circle the correct answer. (16 pts)

A) Soluble OR Insoluble



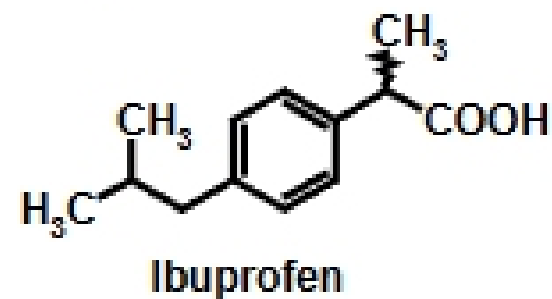
B) Soluble OR Insoluble



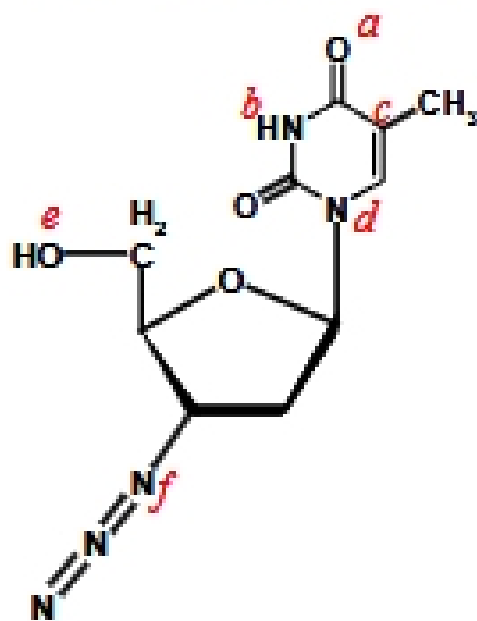
C) Soluble OR Insoluble



D) Soluble OR Insoluble



10. Azidothymidine (below) is an inhibitor of HIV reverse transcriptase enzyme. Write the hybridization state of non-hydrogen atoms marked 'a' (oxygen), 'b' (nitrogen), 'c' (carbon), 'd' (nitrogen), 'e' (oxygen) and 'f' (nitrogen). Also indicate the type of geometry corresponding to the hybridization. (12 pts)



	Hybridization state	Type of Geometry
a =	_____	_____
b =	_____	_____
c =	_____	_____
d =	_____	_____
e =	_____	_____
f =	_____	_____