CHM 233 : Fall 2016
Quiz #5

Question 1

Which of the following best describes **BOTH** a picture of $\Psi$ for the bonding molecular orbital between nitrogen and the carbon of the -CH$_3$ group, **AND** a picture of $\Psi^2$ for the N-H bonding molecular orbital in the recreational drug Ketamine, structure shown.

- the colors blue, green and grey have no particular significance, except that changes in a picture color mean the same thing as shading and non-shading.


![Image of molecular orbitals](image)

**A**

**B**

**C**

**D**

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**Question 2**

The non-nutritive sweetener neotame, shown below, is ca. 7000 times sweeter than sugar.

![Image of neotame molecule](image)

The functional groups in neotame **include**:

- **A** = 1 acid, 2 amides, 1 aromatic
- **B** = 2 amines, 1 ester, 1 aromatic
- **C** = 1 ester, 1 amine, 1 aromatic
- **D** = 1 ester, 1 acid, 1 alcohol
Question 3

MCbdea

For the specific C-H bonds numbered 1 - 4 in the following structure, which would be the expected order of bond LENGTHS?

\[
\begin{array}{c}
\text{H} \\
\text{2} \\
\text{1} \\
\text{3} \\
\text{4}
\end{array}
\]

A 3 > 1 > 2 ~ 4  
B 4 > 2 > 3 ~ 1  
C 1 > 2 > 3 > 4  
D 4 ~ 2 > 1 > 3

Question 4

MCbded

Which is the expected order of bond dissociation energies for the 4 bonds from carbon to Ha, Hb, Hc and Hd? (~ means roughly the same as...)

\[
\begin{array}{c}
\text{Ha} \\
\text{Hb} \\
\text{Hc} \\
\text{Hd}
\end{array}
\]

A Hd ~ Hc < Ha < Hb  
B Hc < Hd < Hb < Ha  
C Ha < Hb < Hd < Hc  
D Ha < Hb < Hc ~ Hd

Question 5

MC10ab

which correctly describes the respective degrees of unsaturation for the following four compounds?

1. Cadaverine, C_5H_{14}N_2, foul-smelling, found in dead tissue  
2. Zingerone, C_{11}H_{14}O_2, hot-tasting compound found in ginger  
3. Adapalene, C_{28}H_{28}O_3, used to treat acne  
4. Miconazole, C_{18}H_{14}Cl_{4}N_2O, an anti-fungal agent

\[
\begin{array}{cccc}
\text{Cadaverine,} & 2 & 0 & 2 & 0 \\
\text{Zingerone} & 5 & 7 & 5 & 5 \\
\text{Adapalene} & 14 & 15 & 15 & 15 \\
\text{Miconazole} & 11 & 10 & 11 & 11 \\
\end{array}
\]

degrees of unsaturation
Question 6
MCdipole2
Which has the LARGEST BOND dipole moment? (select the bond with the largest bond dipole moment in each structure, then compare these to determine the largest overall)

A

B

C

D

Question 7
MCfunct3
My mother used to take Ramipril to control high blood pressure. The functional groups in Ramipril INCLUDE

A one alcohol, one ester, one amide
B one amide, one carboxylic acid, one aromatic
C one amine, one carboxylic acid, one ether
D one ester, one aromatic, one alcohol

Question 8
This problem is slightly more difficult than you should expect to see on a midterm exam
MC10zy
How many different isomeric structures with the molecular formula C₆H₁₂O can you draw, where each structure MUST contain the KETONE functional group?

A 4
B 5
C 6
D 7
QUESTION 9
There are NO INCORRECT answers to this question, ALL answers to this question will be considered correct for grading purposes
What overall final grade do you expect to earn in this class?
A  
B  
C  
D  

QUESTION 10
There are NO INCORRECT answers to this question, ALL answers to this question will be considered correct for grading purposes
How hard did you work on organic chemistry this week (not including watching/attending lectures)
A Very Hard  
B Hard  
C Somewhat Hard  
D Not very Hard this week