

Examination I

Bennett Department of Chemistry

West Virginia University

February 7th, 2008

Name: _____

This exam is a closed book, closed notes.

Calculators and a molecular model set are allowed.

You must show your work in order to receive partial credited.

Question #1 (21 points): _____

Question #2 (18 points): _____

Question #3 (17 points): _____

Question #4 (15 points): _____

Question #5 (11 points): _____

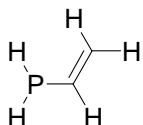
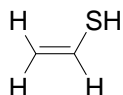
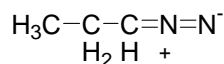
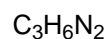
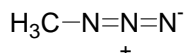
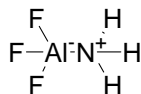
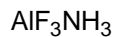
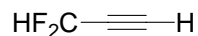
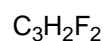
Question #6 (10 points): _____

Question #7 (8 points): _____

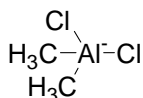
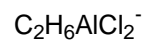
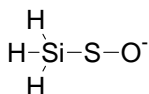
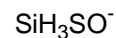
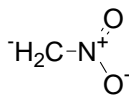
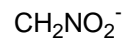
Total (out of 100) : _____

Question 2 (18 points):

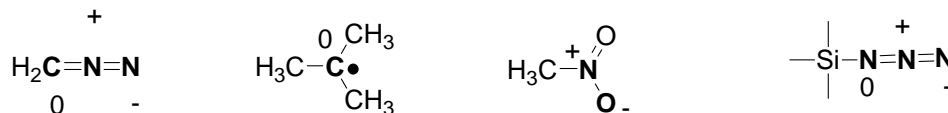
2a) Draw the Lewis structures of the following molecules (6 points).



2b) Draw the Lewis structures of the following molecules label the formal charges (6 points).

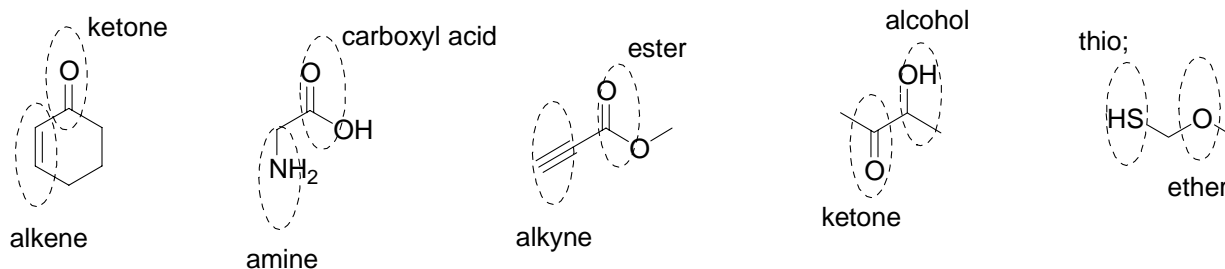


2c) Provide the formal charges of the bold atoms (note, some of the lone pair electrons are omitted for the simplification purpose and all asked atoms are octet unless other noticed) (6 points).



Question 3 (17 points):

3a) Circle at least two functional groups from the following molecules and give their names (10 points).

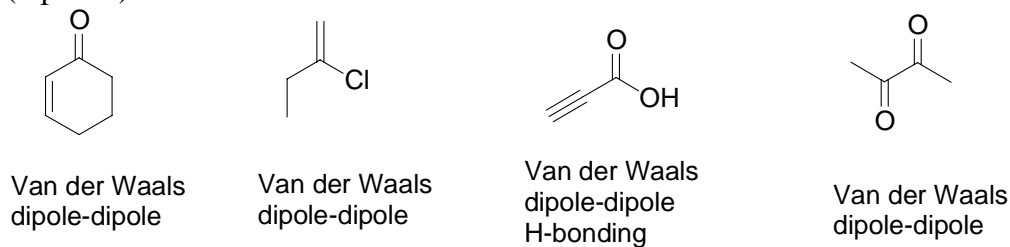


3b) Provide examples of the following functional groups (3 points)

Aldehyde Amide Sulfide ether ketone thiol

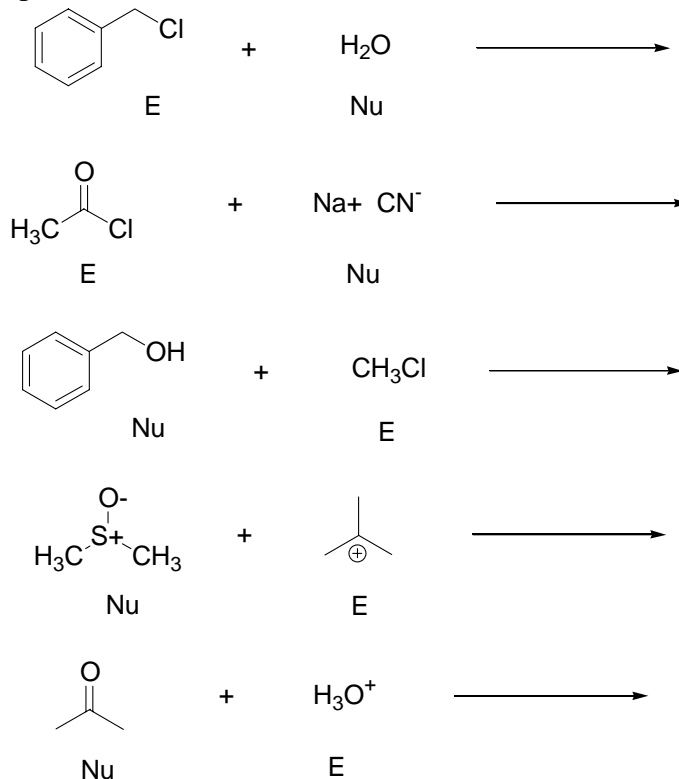
Looks them up from your book

3c) List ALL intermolecular interactions present in the following molecules (no more, no less). (4 points).

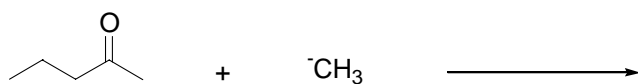


Question 4 (15 points):

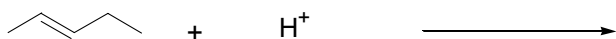
4a) Clearly indicate which reactant is the nucleophile and which one is electrophile in the following reactions (5 points).



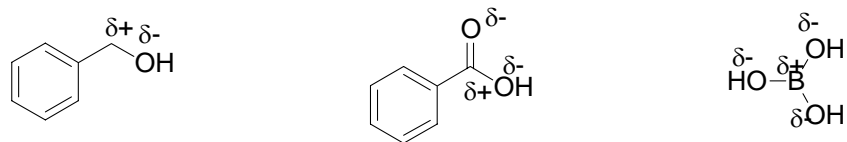
4b) Explain whether the following reactions can occur (4 points).



home work 3.39

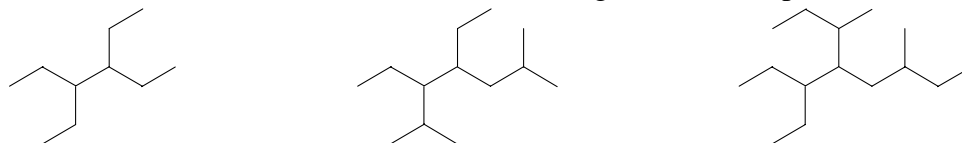


4c) Label the electrophilic and Nucleophilic site of the following molecules (6 points).



Question 5 (6 points):

5a) label the 1°, 2°, 3°, 4° carbon of the following molecules (3 points).



skip, check your book and be careful

5a) Draw the following substituent groups (3 points).

n-butyl

isopropyl

sec-butyl

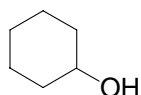
tert-butyl

octyl

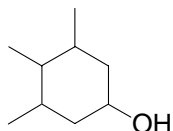
skip

Question 6 (10 points):

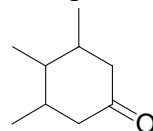
6a) Rank the boiling point of the following molecules (6 points).



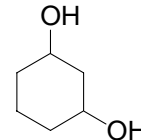
3



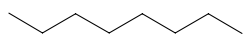
2



4



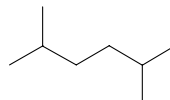
1



1



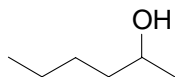
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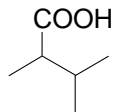
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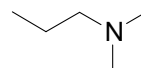
3



2



1



3

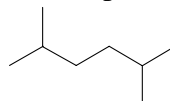
6b) Rank the melting point of the following molecules (4 points).



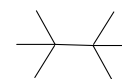
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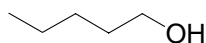
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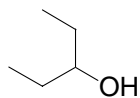
2



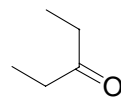
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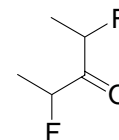
2



1



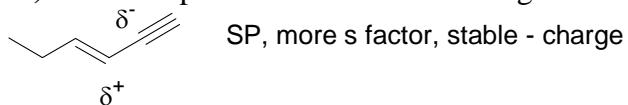
4



3

Question 7 (8 points):

7a) Draw the polar bond of the following molecules and indicate partial charge (δ^+/δ^-) (2 points).



7b) Draw 5 isomers of C_4H_8 (3 points).

Practice exam question

7c) Rank the polarity of CCl_4 , $CHCl_3$, CH_2Cl_2 and **explain why** (3 points).

Check your class note

