Sultan Qaboos University
College of Science, Department of Chemistry

Chem3322
Organic Chemistry I

Fall 2009

Test 1 B

3 November, 2009

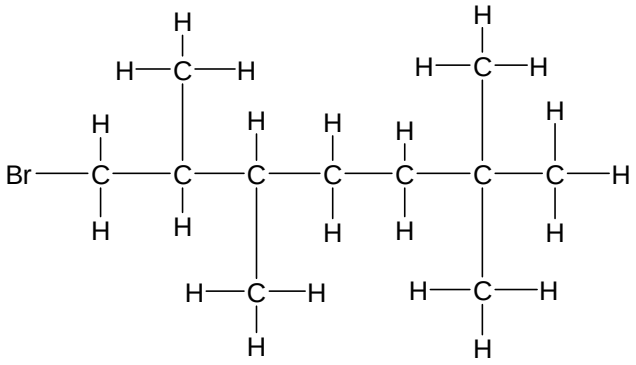
Test Duration: 75 minutes

Name: _____ ID: _____

Question	Earned Mark	Maximum Mark
1		24
2		24
3		22
Total		70

Question 1 — 24 marks

a. Consider the following line-bond structure:



i. Convert the line-bond structure into a condensed structure

ii. Convert it to a skeletal drawing

iii. What is the most polar bond in the above structure? Indicate the direction of polarity of that bond.

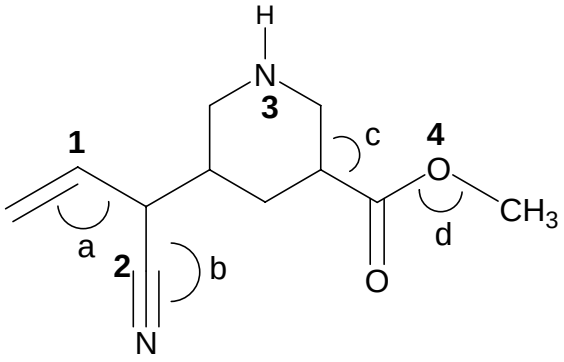
b. Provide structures according to the following descriptions:

i. ***Two*** isomers of the formula C_6H_{14}

ii. ***Two*** amides of the formula C_3H_7NO

iii. ***One*** aldehyde and ***one*** ketone of the formula C_4H_8O

c. Consider the following structure:



i. Predict angles a, b, c and d

a: _____ b: _____

c: _____ d: _____

ii. What is the hybridization of atoms 1, 2, 3, and 4?

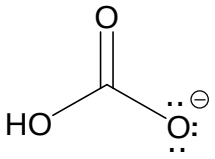
1: _____ 2: _____ 3: _____ 4: _____

iii. Circle and identify the functional groups present

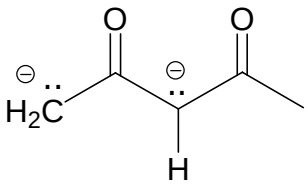
Question 2 24 marks

a. Draw the required number of resonance structures for the following species. Use curved arrows to indicate electron movement in going from one structure to another.

i. (***Two resonance structures***)



ii. (***Three resonance structures***)



b. Consider the following substances.

CH_3OH	HF
pKa 15.5	pKa 3.2

i. Write a likely reaction between one of these substances and the conjugate base of the other

ii. Explain your answer briefly

c. Which of the following substances can act as Lewis acids and which as Lewis bases? Write all possibilities in each case.

BCl_3, PBr_3, CH_3NH_2, H_3O^+, $CrCl_2$, $CH_3SCH_2CH_3$

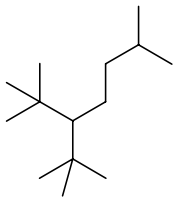
Lewis acids: _____

Lewis bases: _____

Question 3 — 22 marks

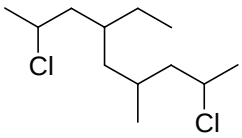
a. Provide IUPAC names for the following structures:

i.



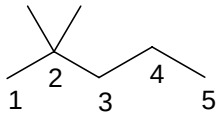
IUPAC name: _____

ii.



IUPAC name: _____

b. Consider 2,2-dimethylpentane whose structure is shown below:



i. Draw ***four different*** Newman projections by sighting along **C3-C4** bond
ii. Which is the most sable conformation? Which is the least stable? Explain your answer briefly.
iii. Draw a ***qualitative*** energy diagram of the four projections you have drawn above

End of Test 1