CHEM 3311 **HARRINGTON**

Exam 1 7:00 – 8:30 PM September 20, 2016 in MATH 100

Instructions. No notes, books, laptops, phones, or calculators. Periodic Table and electronegativity chart are provided.

NAME:

	Points Possible	**Score**
1	15	
2	11	
3	15	
4	16	
5	14	
6	15	
7	14	
Exam 1 Total Raw Score	100	
Curve		
Exam 1 Curved Score		
Exam 1 Letter Grade		

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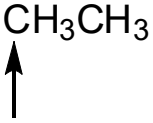
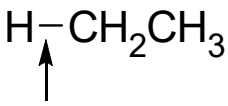
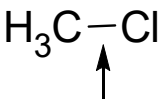
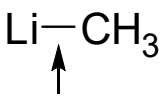
1.(**15 points**) For each molecule, draw a Lewis Dot structure and then use VSEPR Theory to predict the approximate **MOLECULAR GEOMETRY** around the indicated atoms.

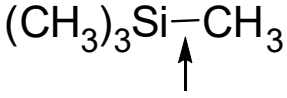


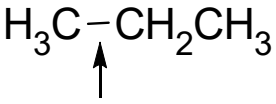
2. (**11 points**) For each covalent bond shown below, indicate if the bond is **polar or nonpolar**. If the bond is polar, indicate the **direction of the polarization** using partial charges (δ^+ and δ^-).

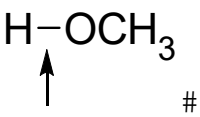




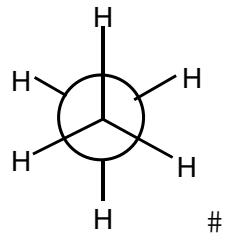
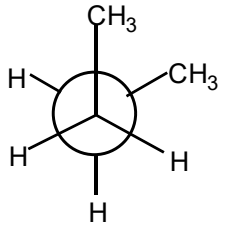
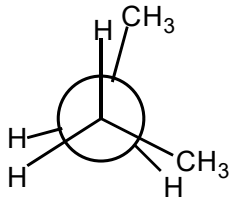
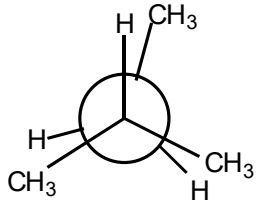
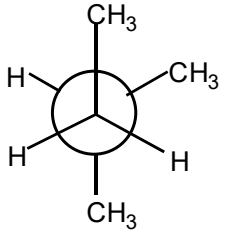








3. (**15 points**) Follow the directions given to convert each Newman projection into a second Newman projection. Draw the second projection. Is the second projection **HIGHER** in energy than the first, **LOWER** in energy than the first, or the **SAME** energy as the first?

Projection #1	**Directions**	**Projection #2**	**Higher Energy Lower Energy Same Energy?**
# 	rotate back C 60°clockwise		
	rotate back C 120° clockwise		
	rotate back C 120°clockwise		
	rotate back C 180° clockwise		
	rotate back C 120°counterclockwise		

4. (**16 points**) Name each of the following compounds using IUPAC substitutive nomenclature.

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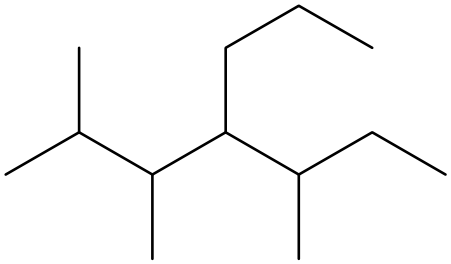
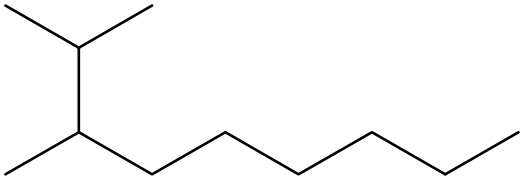
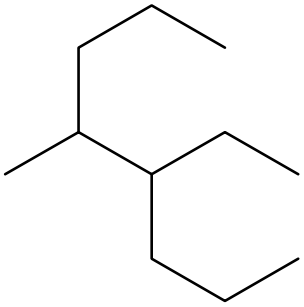
a.



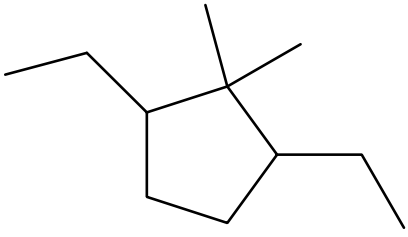
b.



c.



d.



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5. (**14 points**) Draw structures for **all the constitutional isomers** of C_6H_{14}.

Classify all the C's in **one** of your structures.

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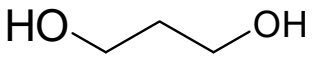
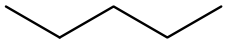
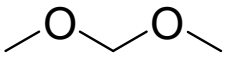
6. (**15 points**) The five compounds below have a molecular weight in the range of 72 to 76 g/mol *but their boiling points range from +9 to +211°C!* **List all relevant intermolecular attractive forces for each compound**. Use these forces to explain your match of each compound to a boiling point.



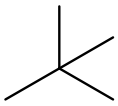
A



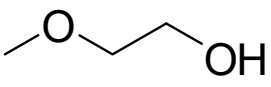
B



C



D



E

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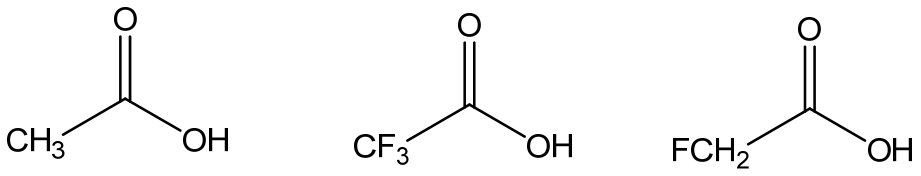
Compound	**Boiling Point** (°C)	**Intermolecular Attractive Forces**
	211	
	124	
	42	
	36	
	9	

7. (**14 points**) For each set of three compounds, label the most acidic #1 and the least acidic #3. Provide a brief explanation for each answer in the space provided.

a. H_2O CH_4 NH_3

b. $ClCH_2CH_2SH$ CH_3CH_2OH CH_3CH_2SH

c. 

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