

Name _____

CHM 2001 - Organic Chemistry I

Quiz I – Thursday 23 September 2010

Professor Parikh

Please read through each problem carefully and enter your answer in the box provided. A periodic table is provided at the end of the exam with additional scrap paper.

- the exam is closed book (no book or notes allowed)
- you may not refer to your cellular phone or pager (please turn them off)
- You may use your model set (there is no borrowing or leading of model sets)

A note about drawing structures: **You should use line structures; make your drawings as clear as possible to understand - stereochemistry should be indicated unambiguously using conventional drawing techniques (eg. bold wedges and dashes).**

Problem 1 _____ / 20 pts

Problem 2 _____ / 6 pts

Problem 3 _____ / 6 pts

Problem 4 _____ / 8 pts

TOTAL

/ 40 points

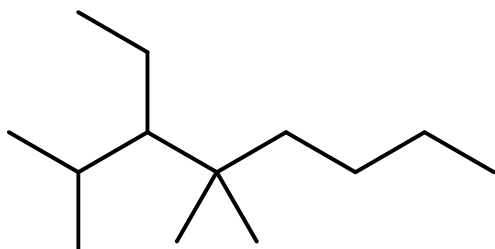
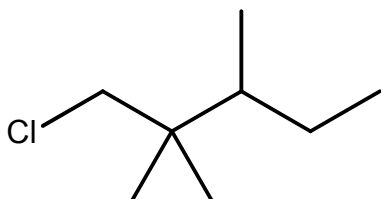
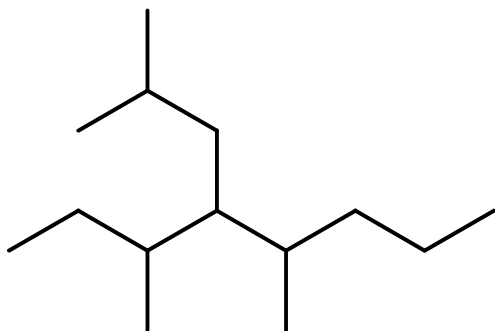
Problem 1: Give the letter of the term that best matches the given definitions below (20 points; 2 points each). Provide the answers in the box provided on the bottom page.

- | | |
|-------------------------------|-------------------------------|
| a. Brønsted-Lowry Acid | f. Ionic Bond |
| b. Brønsted-Lowry Base | g. Covalent Bond |
| c. Lewis Acid | h. Polar-Covalent Bond |
| d. Lewis Base | i. Hydrophobic |
| e. Electronegativity | j. Hydrophilic |

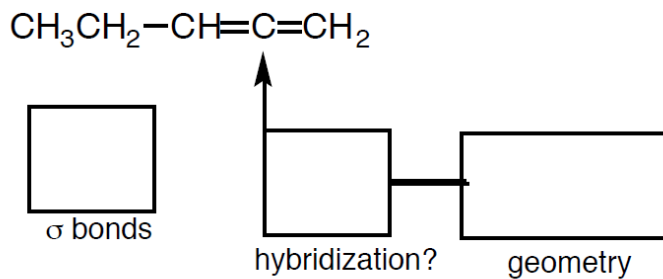
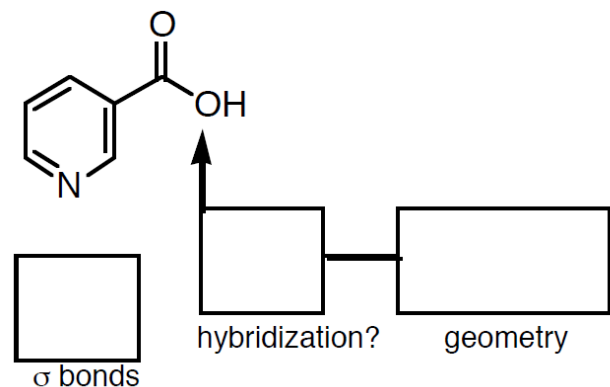
1. Any species that can accept electrons.
2. A bond between two atoms differing in electronegativity by 0.5 – 2.
3. A term used to describe a “water loving” species.
4. A compound that can donate a proton.
5. The ability of an atom to attract the shared electrons in a covalent bond.
6. A term used to describe a “water fearing” species.
7. Any species that can donate electrons.
8. A bond between two atoms differing in electronegativity by < 0.5
9. A compound that can accept a proton.
10. A bond between two atoms differing in electronegativity by > 2 .

1.	2.	3.	4.	5.
6.	7.	8.	9.	10.

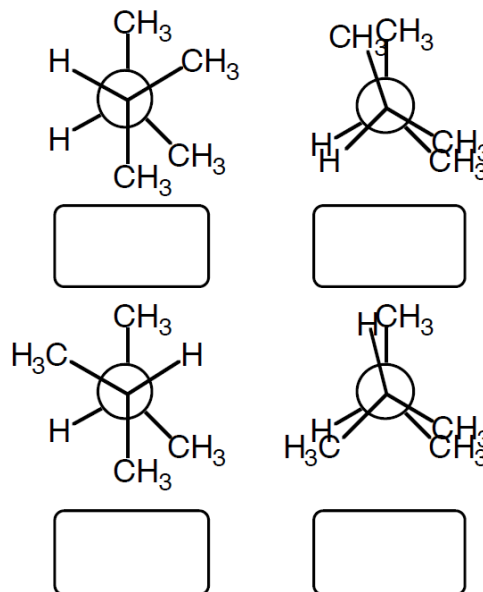
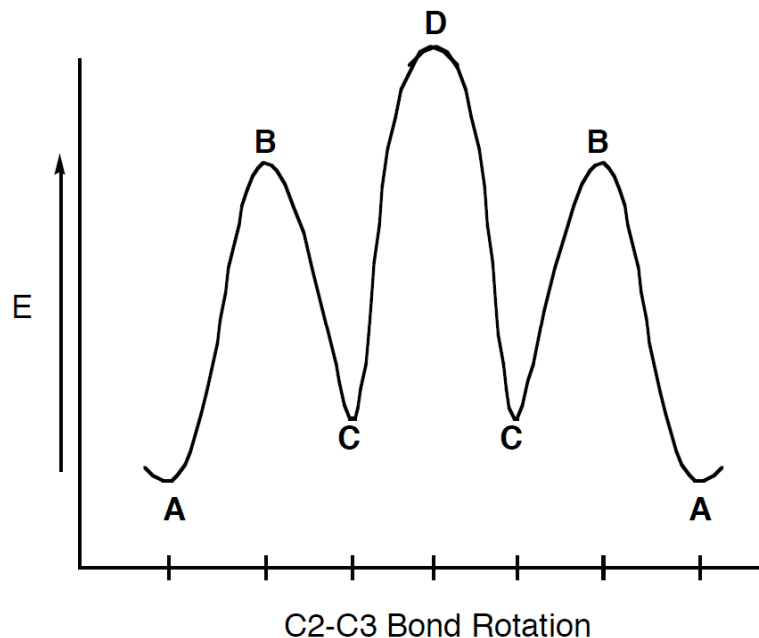
Problem 2: Provide the IUPAC name for the following compounds (6 points; 2 points each):



Problem 3: For the following compounds, determine the number of sigma bonds, and indicate the hybridization and geometry of the specified atoms. (6 points; 1 point each).



Problem 4: The energy diagram below shows the energy change in the conformations of 2,3-dimethylbutane as the C2-C3 bond is rotated. Each extreme in energy is marked with a letter. In the box below each conformation place the letter that corresponds to that extreme. (8 points; 2 points each).



1 Group IA

2 Group IIA

3 Group IIIB

4 Group IVB

5 Group VB

6 Group VIB

7 Group VIIB

8 Group

9 Group VIII

10 Group

11 Group IB

12 Group IIB

13 Group IIIB

14 Group IVA

15 Group VA

16 Group VIA

17 Group VIIA

18 Group VIIIA

Period

1

2

3

4

5

6

7

6

7

Atomic number

Symbol

Atomic mass

Metal

Semimetal

Nonmetal

58 Ce 140.1

59 Pr 140.9

60 Nd 144.2

61 Pm 146.9

62 Sm 150.4

63 Eu 152.0

64 Gd 157.3

65 Tb 158.9

66 Dy 162.5

67 Ho 164.9

68 Er 167.3

69 Tm 168.9

70 Yb 173.0

71 Lu 175.0

90 Th 232.0

91 Pa 231.0

92 U 238.0

93 Np (237)

94 Pu (244)

95 Am (243)

96 Cm (247)

97 Bk (247)

98 Cf (251)

99 Es (252)

100 Fm (257)

101 Md (258)

102 No (259)

103 Lr (262)

An atomic mass in parentheses indicates the mass of the most stable isotope of that element.