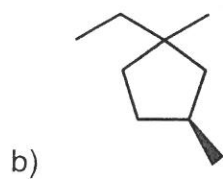
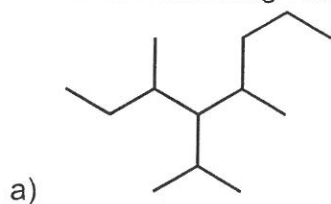


Chemistry 221: ASC Practice Exam 1

1) Name the following compounds

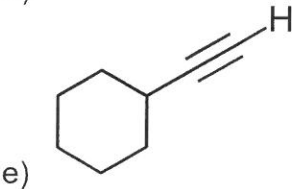
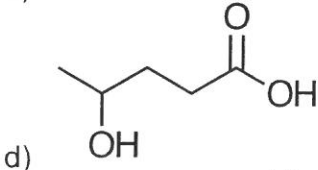
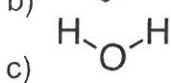
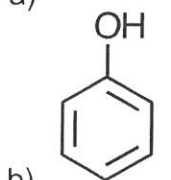
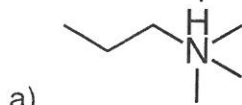


2) Draw the following compounds

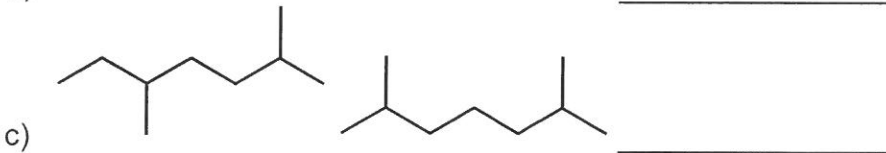
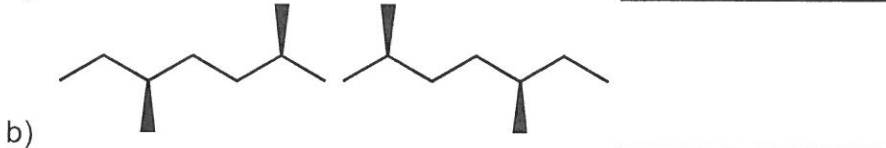
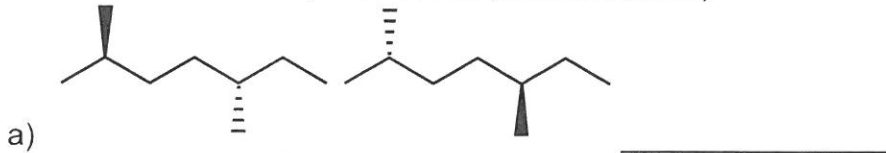
a) (R)- 4-isobutylhexane

b) (1R, 2S, 4R)- 4-ethyl-1,2-dimethylcycloheptane

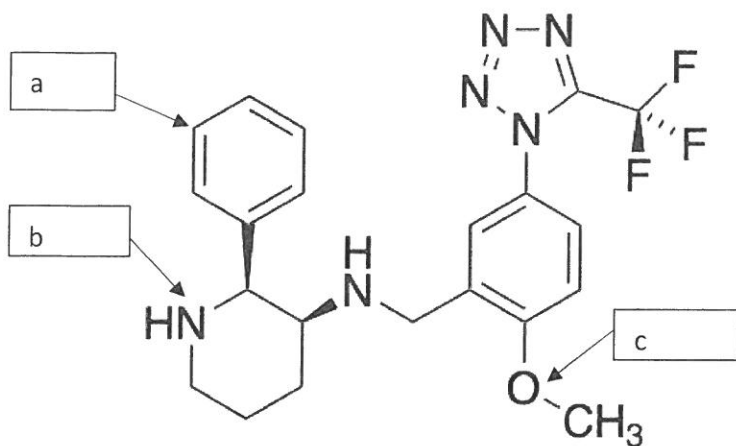
3) For each compound state the pKa of the most acidic hydrogen



4) Identify the relationship between the pairs of compounds (same compound, constitutional isomers, enantiomers, diastereomers)



5) Provide the following information about the indicated atom. For the functional group give the name of the functional group that contains the specific atoms:



- a. Hybridization \_\_\_\_ Functional Group \_\_\_\_  
 b. Hybridization \_\_\_\_ Functional Group \_\_\_\_  
 c. Hybridization \_\_\_\_ Functional Group \_\_\_\_

6) Use the standard shapes of the s and p orbitals to draw examples of each type of orbital interaction listed below:

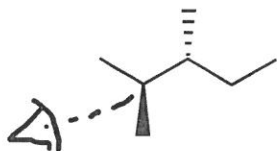
a) 2 s orbitals, sigma\* interaction

b) 2 p orbitals, pi bonding interaction

c) 2 p orbitals, pi\* antibonding

7) Draw 5 unique constitutional isomers with the formula  $C_4H_{10}$ .

8) a. Draw the following structure's Newman projection looking down the indicated carbon-carbon bond (This will be your starting point at 0).



b. Draw the conformations obtained by spinning the front carbon of the above Newman projection. Make sure to rotate clockwise. ***\*On the next page\****

c. Draw the corresponding energy coordinate diagram for the Newman projections. ***\*On the next page\****

