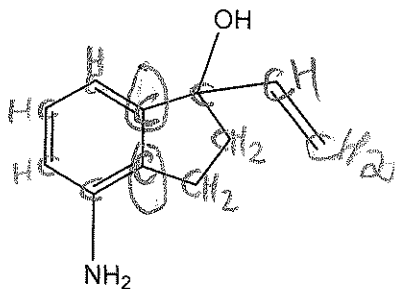
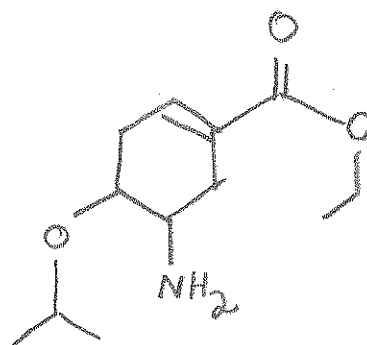
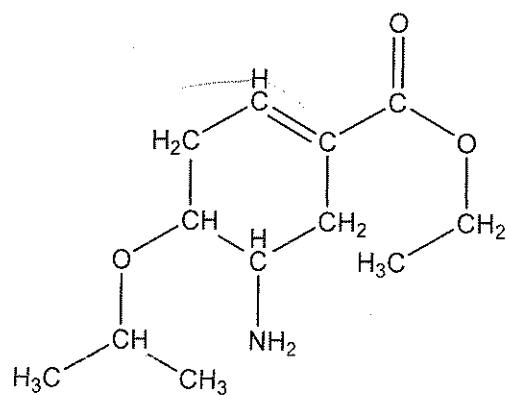


key

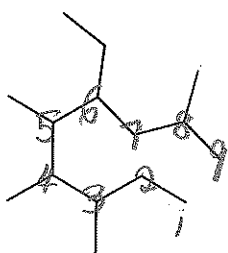
1. Convert the following structure from line bond notation to a Lewis structure. (5 pts)



2. Convert the following Lewis structure to line bond notation. (5 pts)



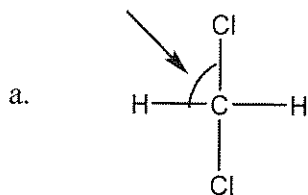
3. Give the official IUPAC name for the following molecule. (5 pts)



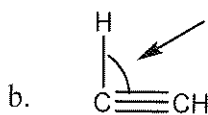
Correct answer is: 4-ethyl-2,5,6,7-tetramethyl
nonane

6-ethyl-3,4,5,8-tetramethyl nonane

4. Using VSEPR theory, indicate the approximate bond angle that would be present in each of the molecules shown below. Note the Lewis structure drawings provided do not necessarily show correct bond angles! (5 pts)



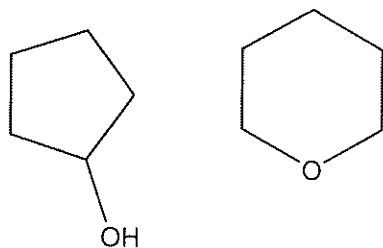
109°



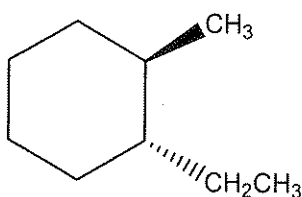
180°

key

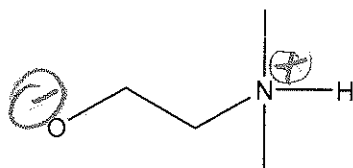
5. What is the relationship between the following two molecules? (5 pts)
Are they identical, constitutional isomers, stereoisomers or unrelated?



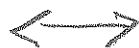
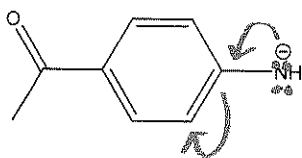
6. Draw both chair forms of the following molecule and circle the one that is more stable. (10 pts)



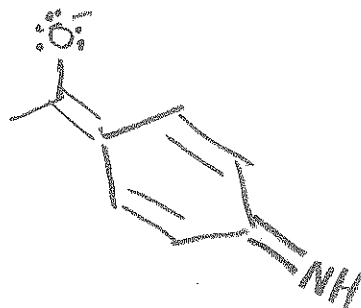
7. Fill in all missing non-zero formal charges on the molecule shown below. (5 pts)



8. Draw **TWO** resonance structures for the molecule shown below. If your resonance structure has any formal charges, be sure to show them clearly. (8 pts)

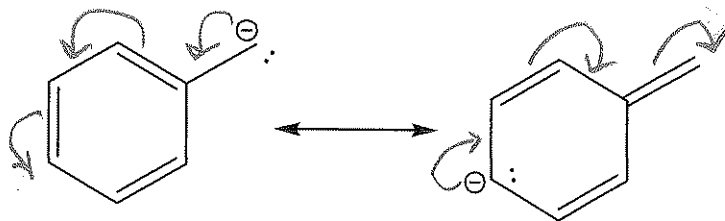


any 2 of these

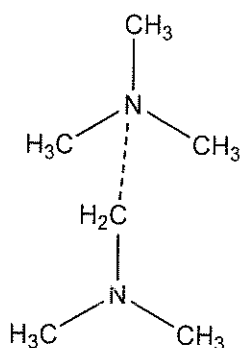


key

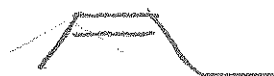
9. Two resonance forms of the same molecule are shown below. Draw arrows to show how the structure on the left would convert to the structure on the right and how the structure on the right would convert to the structure on the left. (8 pts)



10. Which intermolecular force is indicated by the dotted line below: hydrogen bonding or a dipole-dipole interaction? (5 pts)



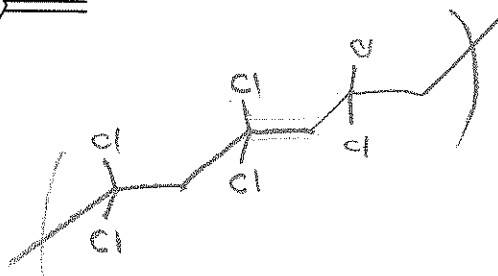
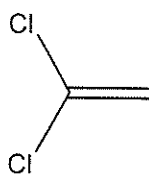
11. Draw the cis form of 2-pentene. (5 pts)



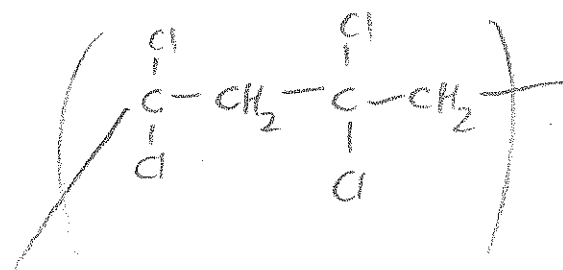
12. Draw the trans form of 3-heptene. (5 pts)



13. What is the structure of the alkene polymer derived from the monomer shown below? (5 pts)



or



Key

14. Fill in the missing compound (starting material, reagent or product) in each of the following reactions. (24 pts)

