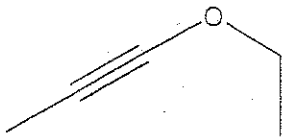
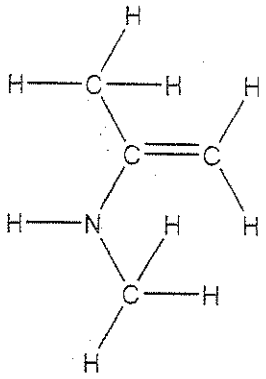
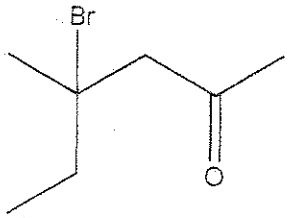
1. Convert the following structure from line bond notation to a Lewis structure. (5 pts)



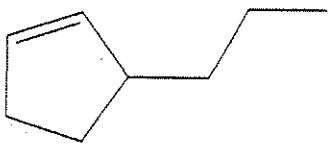
2. Convert the following Lewis structure to line bond notation. (5 pts)



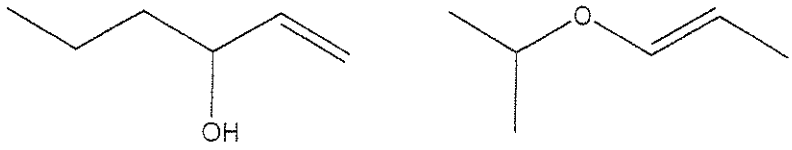
3. Give the official IUPAC name for the following molecule. (5 pts)



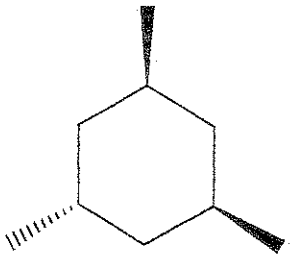
4. Give the official IUPAC name for the following molecule. (5 pts)



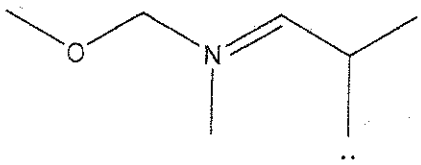
5. What is the relationship between the following two molecules? (5 pts)
Are they identical, constitutional isomers, stereoisomers or unrelated?



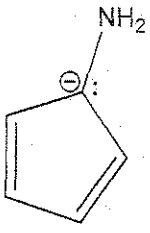
6. Draw both chair forms of the following molecule and circle the one that is more stable. (10 pts)



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

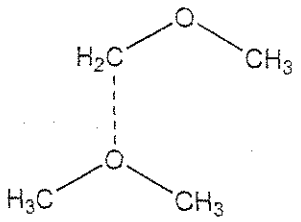


8. Draw a resonance structure for the molecule shown below. If your resonance structure has any formal charges, be sure to show them clearly. (5 pts)



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. (10 pts)

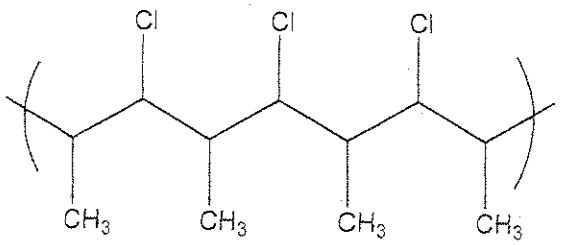
10. Which intermolecular force is indicated by the dotted line below: hydrogen bonding, dipole dipole interaction or London Dispersion Forces? (5 pts)



11. Draw the cis form of $CH_3CH{=}CHCH_2CH_2CH_2CH_3$. (5 pts)

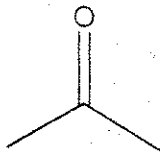
12. Draw trans-2-heptene. (5 pts)

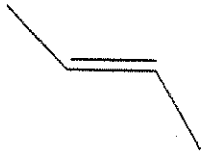
13. What is the structure of the alkene monomer used to create the polymer shown below? (5 pts)

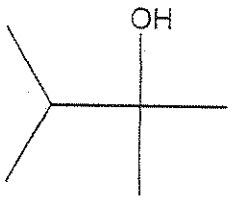


14. Fill in the missing compound (starting material, reagent or product) in each of the following reactions. (25 pts)

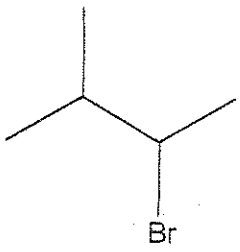
a. ? $\xrightarrow[\text{metal catalyst}]{H_2}$ CH_3CH_3

b. ? $\xrightarrow{K_2Cr_2O_7}$ 

c.  $\xrightarrow{?}$ 

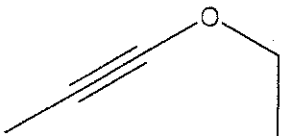
d. 

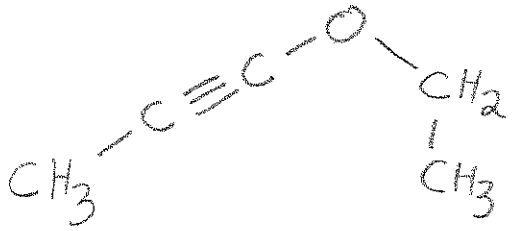
$\xrightarrow{H_2SO_4}$?

e. ? $\xrightarrow{HBr}$ 

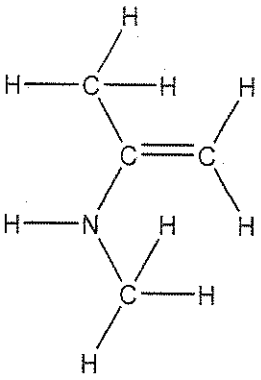
Key

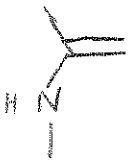
1. Convert the following structure from line bond notation to a Lewis structure. (5 pts)



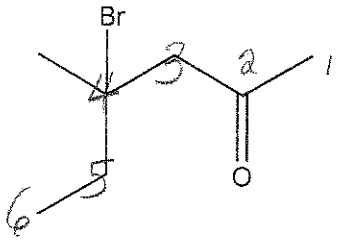


2. Convert the following Lewis structure to line bond notation. (5 pts)



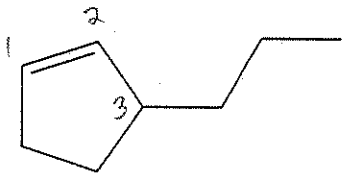


3. Give the official IUPAC name for the following molecule. (5 pts)



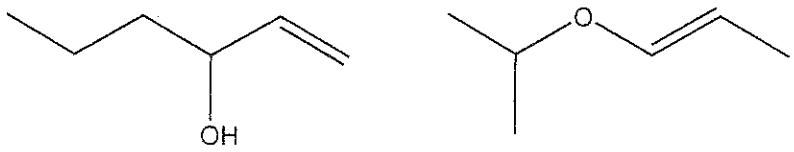
4-broma-
4-methyl-2-hexanone

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

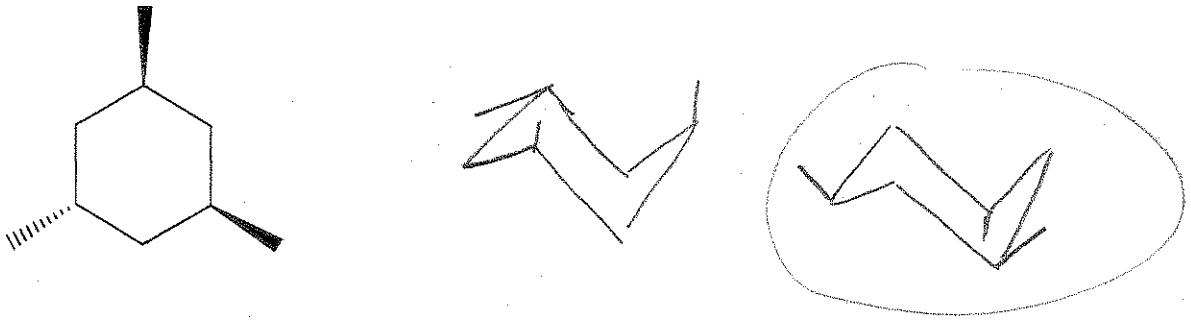


3-propyl cyclopentene

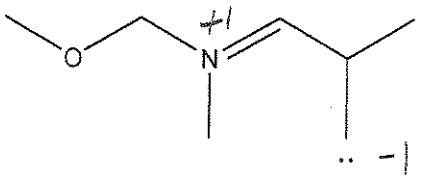
5. What is the relationship between the following two molecules? (5 pts)
Are they identical, constitutional isomers, stereoisomers or unrelated?



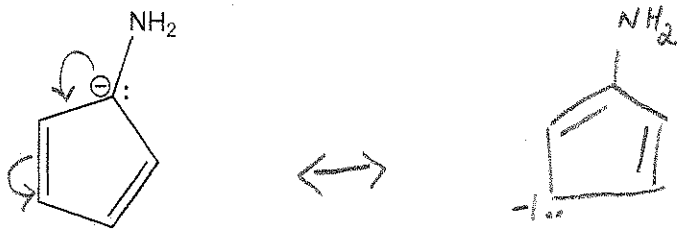
6. Draw both chair forms of the following molecule and circle the one that is more stable. (10 pts)



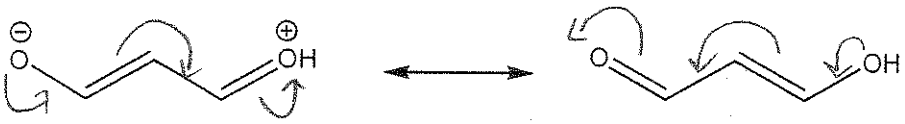
7. Fill in all missing non-zero formal charges on the molecule shown below. (5 pts)



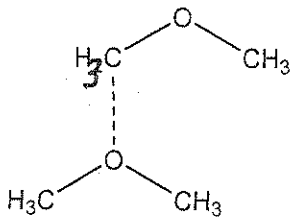
8. Draw a resonance structure for the molecule shown below. If your resonance structure has any formal charges, be sure to show them clearly. (5 pts)



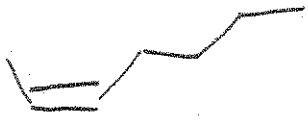
9. Two resonance forms of the same molecule are shown below. Draw arrows to show how the structure on the left would convert to the structure on the right and how the structure on the right would convert to the structure on the left. (10 pts)



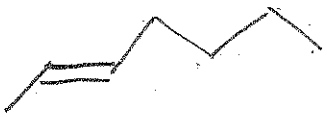
10. Which intermolecular force is indicated by the dotted line below: hydrogen bonding, dipole dipole interaction or London Dispersion Forces? (5 pts)



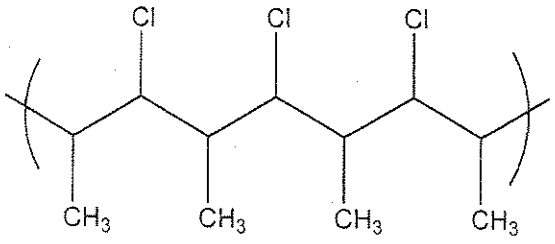
11. Draw the cis form of $CH_3CH{=}CHCH_2CH_2CH_2CH_3$. (5 pts)

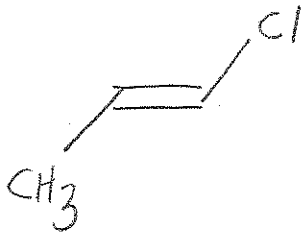


12. Draw trans-2-heptene. (5 pts)



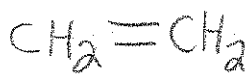
13. What is the structure of the alkene monomer used to create the polymer shown below? (5 pts)

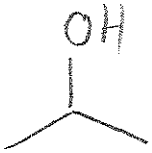
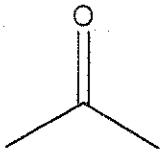


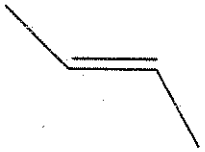


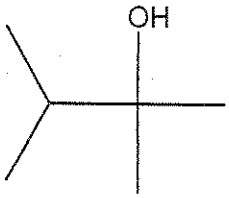
14. Fill in the missing compound (starting material, reagent or product) in each of the following reactions. (25 pts)

a. ? $\xrightarrow[\text{metal catalyst}]{H_2}$ CH_3CH_3



b.  $\xrightarrow[H_2SO_4]{K_2Cr_2O_7}$ 

c.  $\xrightarrow[\text{metal catalyst}]{(H_2)^?}$ 

d.  $\xrightarrow{H_2SO_4}$  ?

e. ? $\xrightarrow{HBr}$