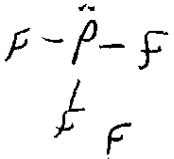
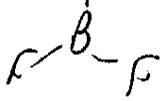
CHEM 1124 Practice Exam 2.

Name Key

(1) Draw the Lewis Dot Structures for the following molecules:

(a) SH_2 

(b) PF_3 

(c) BF_3 

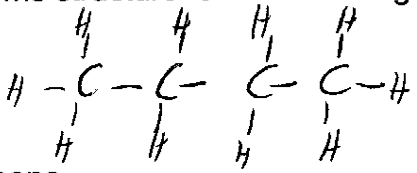
(2) List the VSPER geometry and bond angles for the following molecules:

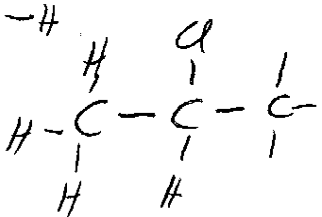
(a) SH_2 bent 109°

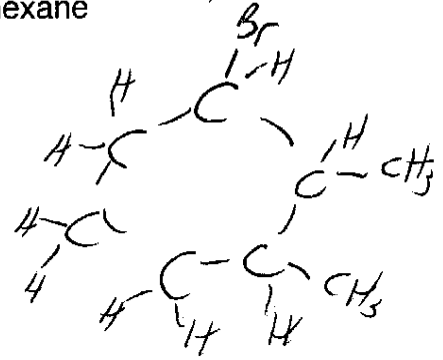
(b) PF_3 trigonal pyramidal 109°

(c) BF_3 trigonal planar 120°

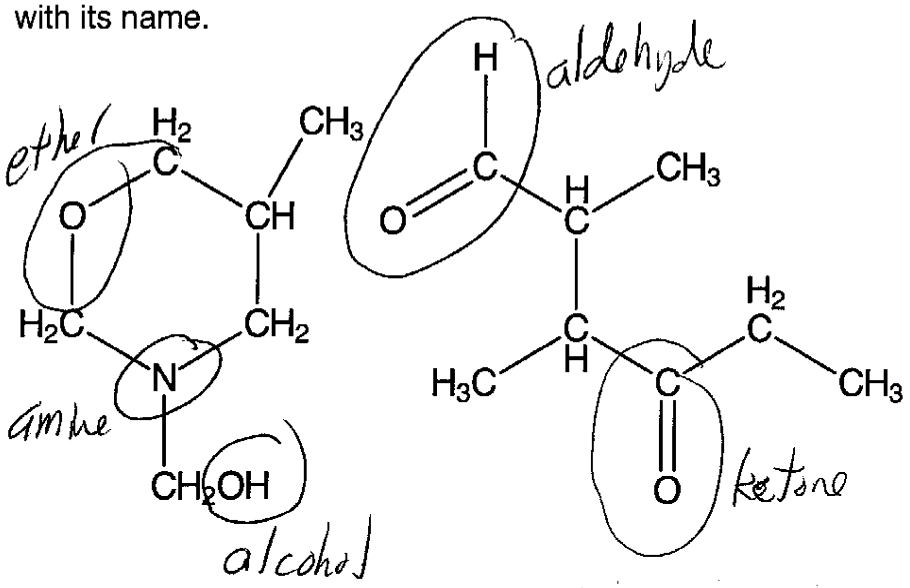
(3) Draw the Lewis structure for the following alkanes

(a) butane 

(b) 2-chloropropane 

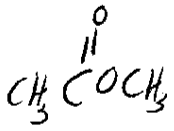
(c) 1-bromo,2,3-dimethylcyclohexane 

(4) Circle the functional groups in the molecules below and label each functional group with its name.



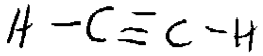
(5) Draw a molecule containing the specified functional group

(a) an ester

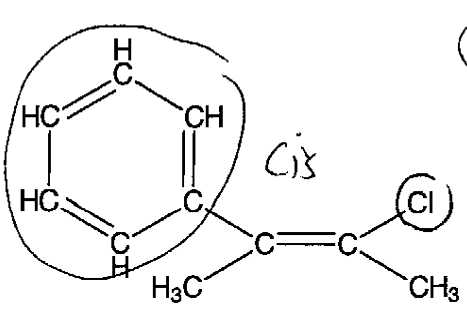


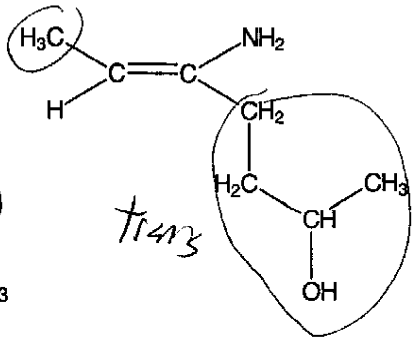
answers will vary

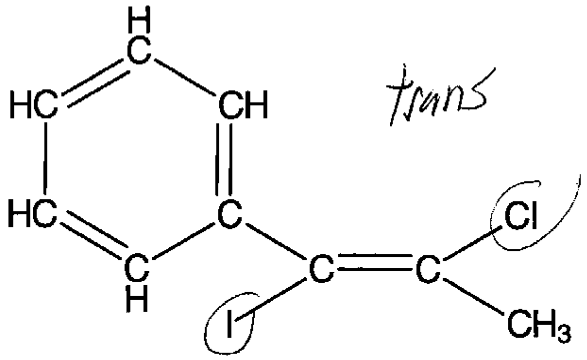
(b) an alkyne



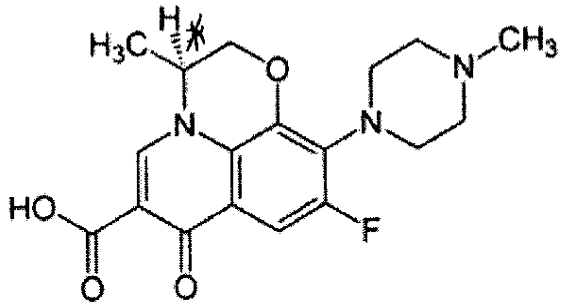
(7) Label the following alkenes as cis or trans

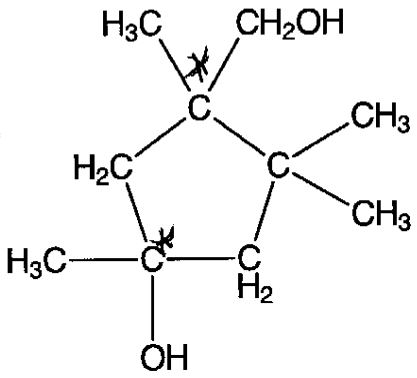






(8) Mark the chiral centers on the following molecules with a *





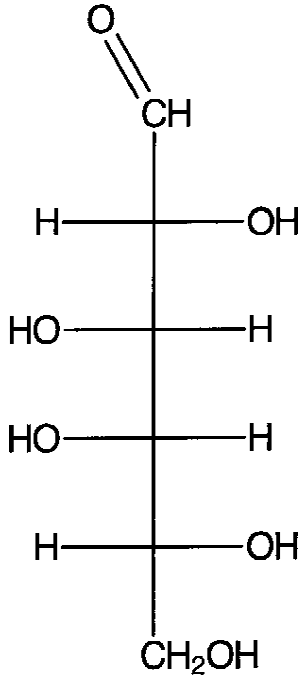
(9) Why are fats and oils sometimes called triglycerides?

three fatty acids are bound to glycerine molecule

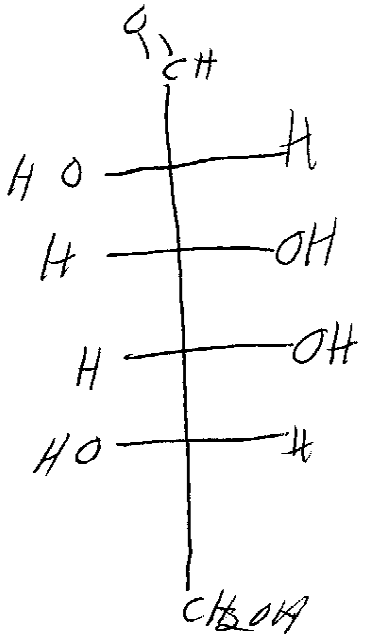
(10) Why do unsaturated fats melt at lower temperatures than saturated fats? How are unsaturated and saturated fats different?

Unsaturated fats have double bonds (cis-double bonds) and these don't pack effectively. This makes it melt at a lower temperature.

(11) For the Fisher projection of galactose below, draw the entantiomer and label both entantiomers as D or L.



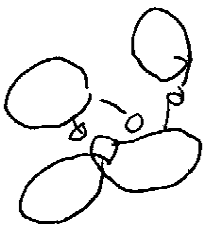
D-galactose



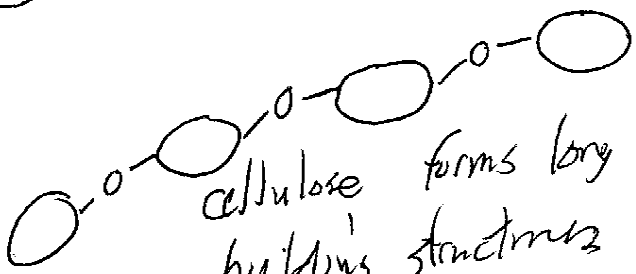
L-galactose

(12) When glucose units are connected in a long chain through α-glycosidic bonds, the result is the storage molecule amylose. When the same glucose molecules are connected in a long chain by β-glycosidic bonds, the result is the structural molecule cellulose. Why is the result so different and why do the resulting polysaccharides have such different properties?

amylose.



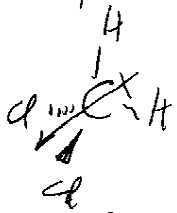
Amylose forms a helical structure because of the α geometry
It packs effectively

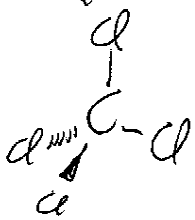


cellulose forms long chains, good for building structures

(13) What intermolecular forces are present in the following molecules?

(a) NH_3  dispersion, dipole-dipole, H-bonds

(b) CH_2Cl_2  dispersion, dipole-dipole

(c) CCl_4  dispersion

(14) Indicate whether the following molecules would be more soluble in water, or hydrocarbons.

(a) glucose water (H-bonds)

(b) a triglyceride hydrocarbons

(c) NH_3 water (H-bonds)

(d) CCl_4 hydrocarbons