Exercises Test 3 CHM1033 Fall 2008-1 Mod. 9-10 3 EC points Name_____

1. Complete the following:

a. Carbon always forms _____ bonds. Oxygen always forms ____ bonds.

2. Indicate the type of compound or compounds for which each of the following can apply. The choices are alkanes, alkenes, cycloalkanes, cycloalkenes or alkynes. More than one choice may apply to each of the following:

a. C_nH_{2n+2} _____ b. C_nH_{2n} _____ c. C_nH_{2n-2} _____

3. Give two properties of hydrocarbons: a._____ b. _____

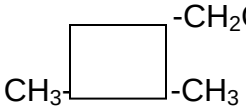
4. What is the shape of carbon and the groups directly attached to it in each of the following?

a. carbon has four single bonds _____ b. carbon has one double bond and two single bonds _____ c. carbon has one triple bond and one single bond _____.

5. Name the following:

a. $CH_3CHCH_2CHCH_2CH_3$ (CH3 on 2nd C, OH on 4th C)

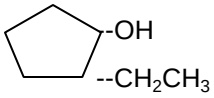
_____

b. 

_____

c. $CH_2{=}CCH_2CH_2CHCH_3$ (CH_3CHCH_3 on 3rd C, Br on 4th C)

_____

d. 

_____

e. $CH_2C{\equiv}CCH_2CHBrCH_3$

_____

6. Draw the structure for each of the following:

a. cis-2,3-dichloro-4-ethyl-2-hexene b. 3,3-diiodocyclohexene

c. 1,1-dibromo-4-propyl-3-octanol d. 2-chloro-2,3,4-trimethylpentane

7. Draw two isomers which are not a straight line for pentane.

8. Which of the following has cis-trans isomers? **Draw all the structures and label each**.

a. 3-ethyl-2-pentene b. 3-hexene

8. Identify the following alcohols as primary, secondary or tertiary. **Draw each**:

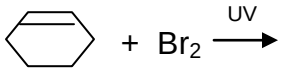
a. 1-methylcyclohexanol _____ b. 3-methyl-2-pentanol _____

b. ethanol _____

9. Complete each of the following reactions and indicate the name of the reaction for each:

Name of Reaction:

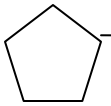
a. $CH_3CH_2CH{=}CH_2 + HCl \longrightarrow$ _____

b.  $+ Br_2 \xrightarrow{UV}$ _____

c. $CH_3CH{=}CH_2 + H_2O \xrightarrow{H^+}$ _____

d. $CH_3CH_2CH_2C{\equiv}CH + 2H_2 \longrightarrow$ _____

e. $CH_3CH_2\underset{\underset{OH}{|}}{CH}CH_2CH_3 \xrightarrow[\text{high T}]{H^+}$ _____

f.  $\xrightarrow{[O]}$ _____

f. $CH_3CH_2CH_2OH \xrightarrow[\text{complete}]{[O]}$ _____

g. $CH_3OH \xrightarrow[\text{Gentle}]{[O]}$ _____

10. Which of the following would you expect to be soluble in water?

a. ethanol_____ b. cyclohexane _____ c. octanol _____

d. $CH_3CH_2\underset{\underset{H}{|}}{C}{=}O$_____ e. $CH_3\underset{\underset{O}{||}}{C}CH_3$_____

11. Organic compounds that are soluble in water is because of _____ with the water molecule.