**In-Class Exam III: Organic Chemistry I Alfred State College \_\_\_\_\_\_/51 pts**

**Wed 12 December 2013**

Your Name: \_\_\_\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3.1. Nomenclature of Alkenes (4 pts)**

Name or draw the compounds below using IUPAC rules unless otherwise indicated. If necessary, make sure to indicate whether the structure is E or Z





\_\_\_**\_ethenol**

**(1-ethen-1-ol**

**Ethen-1-ol reluctantly accepted too**\_\_\_\_\_ \_\_\_**E-6,6-dibromo-3-hepten-3-ol**\_\_\_\_\_\_\_





**3-chloro-1-cyclopentenol**

Z-5-(1-methylethyl)-3-octene

**3.2. Match-Maker Chemistry (8 pts)**

Match the 8 items on the left with the most pertinent descriptor in the list on the right

(Several in the list below are not used.) 1)Baeyer test reagent for alkenes \_**h**\_\_

a) makes halohydrins

b) E1

c)requires beta H

d) ether (dry)

e) carbocation mechanism

f) NBS (N-bromosuccinimide)

g)NH3 (l) and Nao

h)KMnO4 (in CH2Cl2 cold)

i) Pd black and H2

j) peroxides (H2O2)

k) SN2

2)reagents to make E-only alkene **\_g**\_\_

3)necessary for anti-Mark. addition of HBr across C=C **\_j**\_\_

4)Br2/H2O in CCl4 \_**a**\_\_

5) dehydrohalogenation of alkyl halides \_**c**\_\_

6) Markovnikoff additions across C=C \_**e**\_\_

7)reagent needed for allylic substitution of Br on alkene \_**f**\_\_

8) mechanism for dehydration of alcohols \_**b**\_

\_\_\_/12

**3.3** **Eliminating Snacks (12 pts/ 2 pt per completely correct line)**

CIRCLE for both the dehydration and dehydrohalogenation *menus*, the effect of the listed variations on the rates on these two reaction types. **(n/a** means **n**ot **a**pplicable)

**variation effect on dehydration rate effect on dehydrohalogenation rate**

1) substrate concentration up  ***up n/a down up n/a down***

2) OH- concentration increased ***up n/a down up n/a down***

3) Rearrangement occurs ***yes no yes no***

4) Primary H effects occur *yes no yes no*

5) Reaction can occur without βH ***yes***  ***no*** ***yes no***

6) dominant reaction mechanism ***E1 E2 SN1 SN2***  ***E1 E2 SN1 SN2***

**3.4 Soothsaying (8 pts)**

Predict all the possible (=can form) alkenes possible from the reaction shown below and **CIRCLE** the **major** **product**

(3 pts)



**KOH/ethanol**



**Major**

Predict all the possible alkenes possible (= can form) from the reaction below and **CIRCLE** the **most stable** **product**: (**5** pts)

**60% H2SO4/reflux**

Most stable

(Saitsev rule)







From primary from 1,2-H shift from 1,2- methyl shift

carbocation

\_\_\_/20

* 1. **BOXES, LITTLE BOXES (19 points total/ 1 pt each) (see scanned hand-written version)**

Fill in the reagents, products, solvents and/or conditions missing in the reactions below:



1)

peroxides

+

**( Z)-2-butene only**



3)

**E-Only product**

+



4) **n**

H2SO4 /reflux

5) +

2,2-dimethyl-1-propanol

**Major Minor**

Neat or in ether with light



6) +



**wet CCl4**

6) +



7)

2



**\_\_\_/19**

**+**

