1.(16) Give the name of the following compounds. Be sure to Indicate stereochemistry where appropriate (e.g. E or Z).

- 2.(8) Arrange the following series of substituents in order of *increasing* E/Z priority where 1 = lowest and 4 = highest priority.
 - a) -CH(CH₃)₂ -CH₂CH₂CH=CH₂ -CH₂CH₂CH₂CH₂CI -C(CH₃)₃
 - b) $-C \equiv N$ $-CH_2NH_2$ $-CO_2H$ $-CH_2CH_2Br$
- 3.(8) In the addition reaction of HBr to 1-butene, the product formed has a chiral center.
 - a) Draw the intermediate carbocation in this reaction.

$$CH_3CH_2CH=CH_2$$
 \longrightarrow

- b) How many stereoisomers can be formed of the final product? _____ Draw it (them) with Fisher projection(s).
- c) The product is not optically active (does not rotate the plane of plane-polarized light). Suggest a reason why.

4.(12) Give the major product for the following reactions:

b)
$$CH_2$$
 CH_2 2 mol HBr 1 mole

- 5.(12) Arrange the following in order of increasing (1= lowest or least)
 - a) Cahn, Ingold Prelog priority (E,Z priority):

$$\overset{O}{\underset{\parallel}{\text{CH}_2\text{CH}_2\text{OH}}}$$
 , $\overset{O}{\underset{\parallel}{\text{CH}_2\text{CH}_2\text{CH}_2}}$, $\overset{C}{\underset{\parallel}{\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}}}$

b) Stability (think heat of hydrogenation):

6.(8) Give the stepwise mechanism for the following reaction. Use arrows to indicate the electron flow and show any intermediates.

$$\begin{array}{c} \text{CH}_3 \\ \text{CH}_3\text{CHCH=CH}_2 \end{array} \xrightarrow{\begin{array}{c} \text{HBr} \\ \text{HBr} \end{array}} \begin{array}{c} \text{CH}_3 \\ \text{CH}_3\text{CCH}_2\text{CH}_3 \\ \text{Br} \end{array}$$