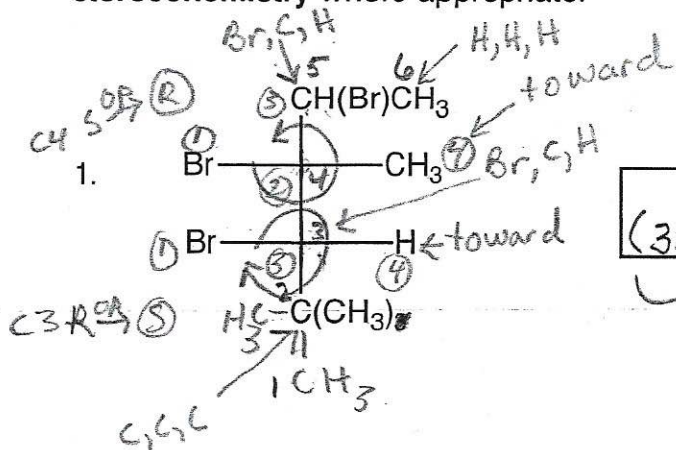


# Exam 2B Fall

## A. Nomenclature: (15 points)

Give an acceptable IUPAC name for each of the compounds. Be sure to indicate the stereochemistry where appropriate.

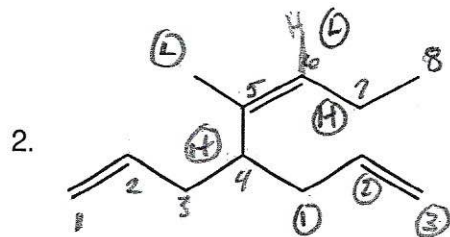


~~(\*)~~ (-) overall for numbering

No dash  
run out of room

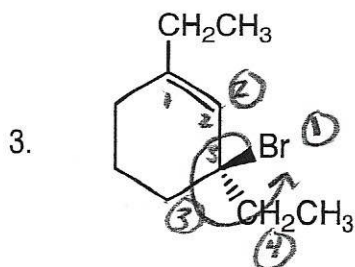
**(3S, 4R)-3,4,5-tribromo-2,2,4-trimethylhexane**

hexane

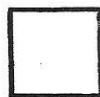


**(Z)-5-methyl-4-(2-propenyl)-1,5-octadiene**

unnecessary  
 ↓  
 -1-cyclohexene

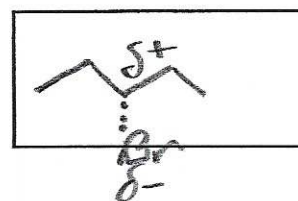
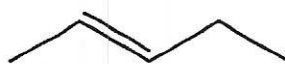
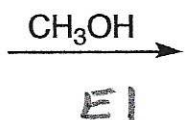
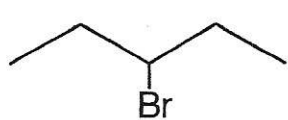


**(S)-3-bromo-1,3-diethylcyclohexene**



Facts: Total points = 29

1. Consider the reaction below. In the box, draw the transition state for the rate determining step. (3pts.)

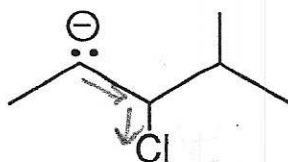


No partial charges (-)

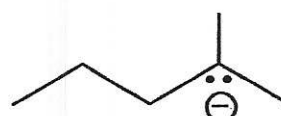
2. Place the following carbanions in order of increasing stability. (1=least stable, 3=most stable) (3 pts.)



2

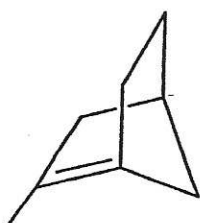


3

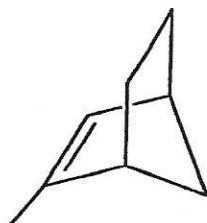


1

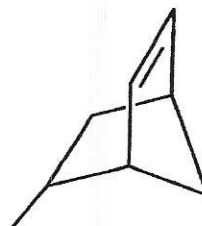
3. Place the following alkenes in order of increasing stability. (1=least stable, 3=most stable) (3 pts.)



1

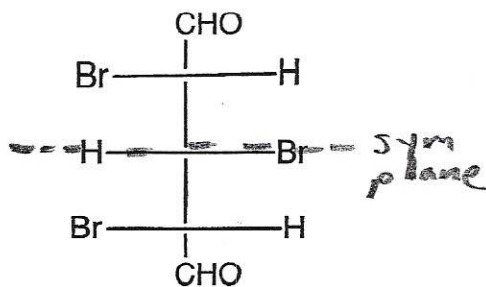


3

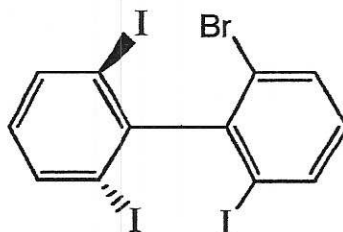


2

4. Label each of the compounds below as chiral or achiral (4 pts.)



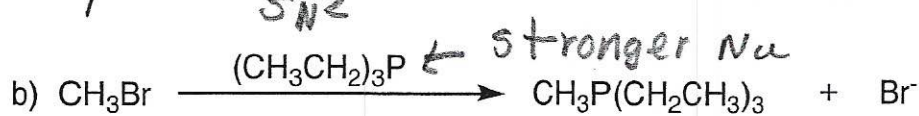
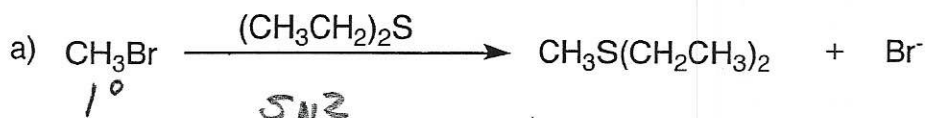
achiral



achiral

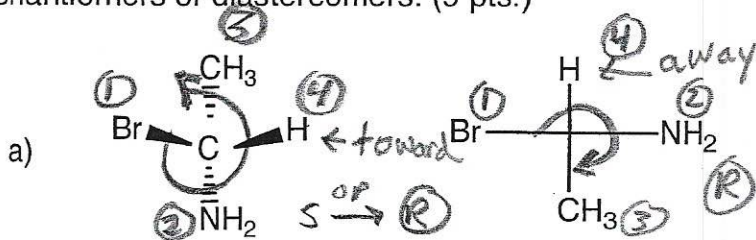


5. In the box provided, place the letter of the reaction with the faster rate. If the rate is the same, write **S** for "same" in the box. (3 pts.)



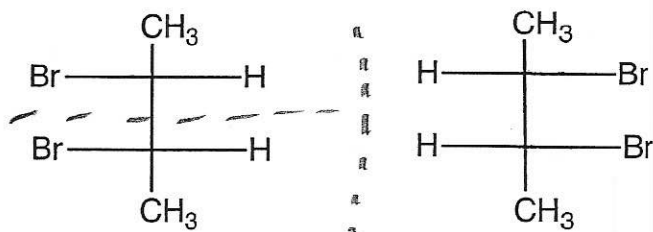
Answer: b

6. Label each of the following pairs as identical, structural isomers, conformational isomers, enantiomers or diastereomers. (9 pts.)

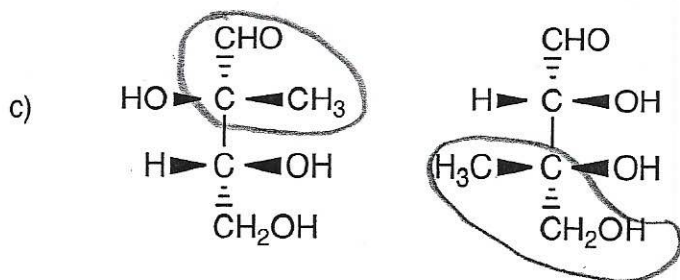


identical

sym plane

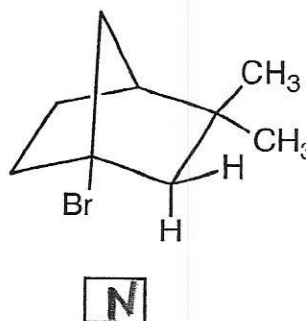
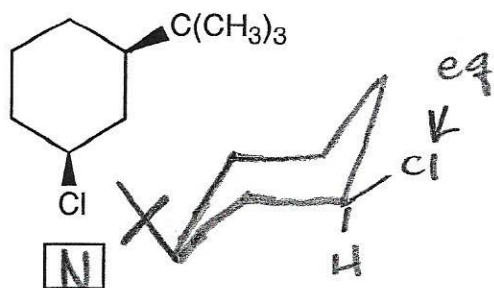


identical



structural

7. If the compound below will rapidly undergo E2, place **Y** for yes in the box. If the compound will not, place **N** for no in the box. (4 pts.)



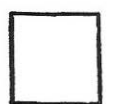
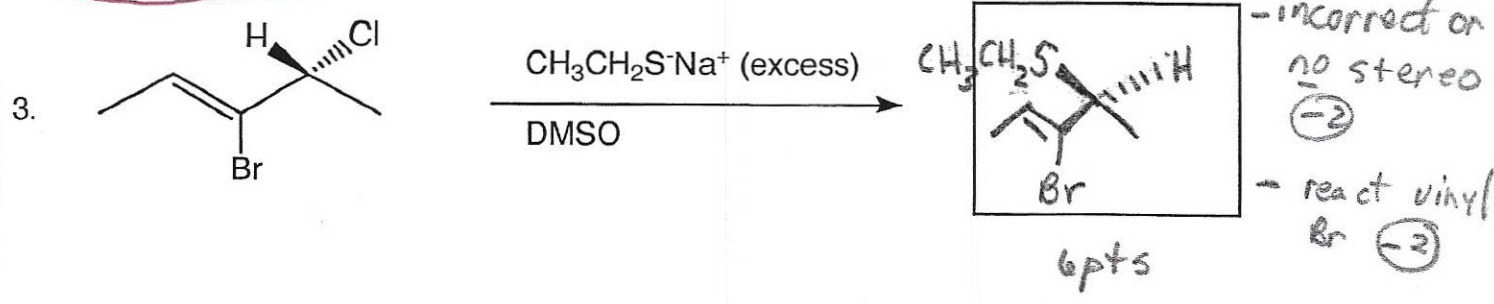
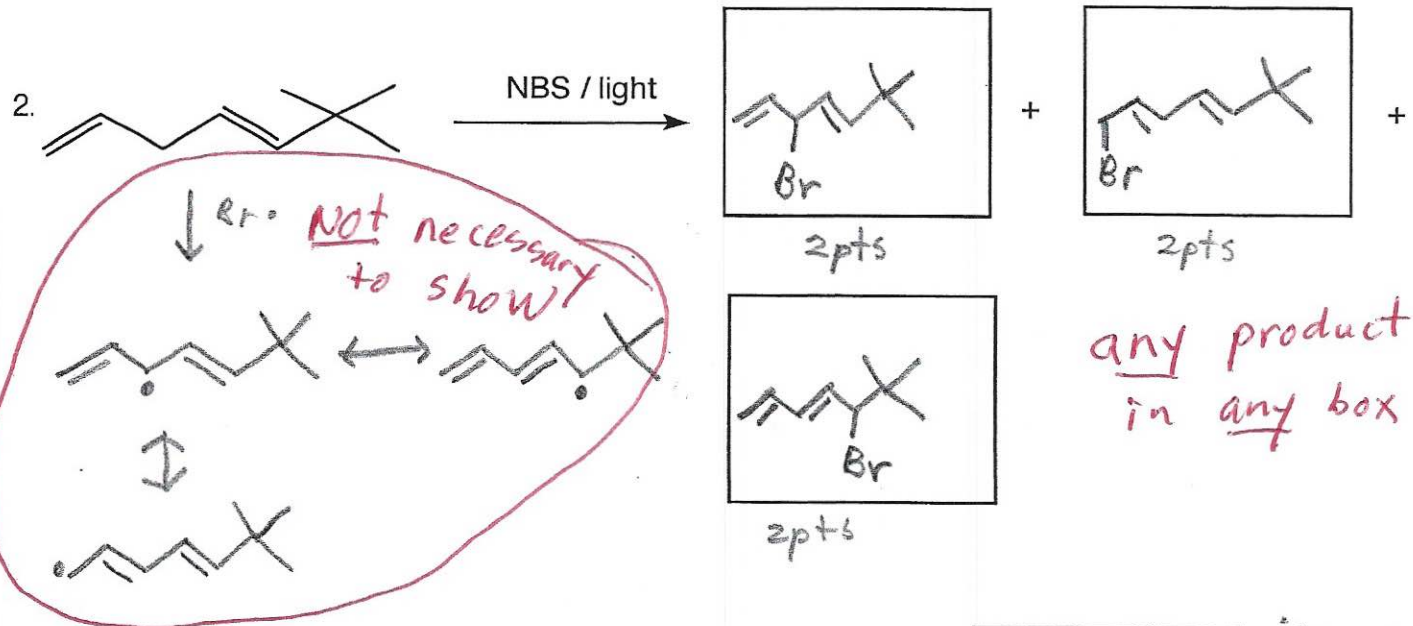
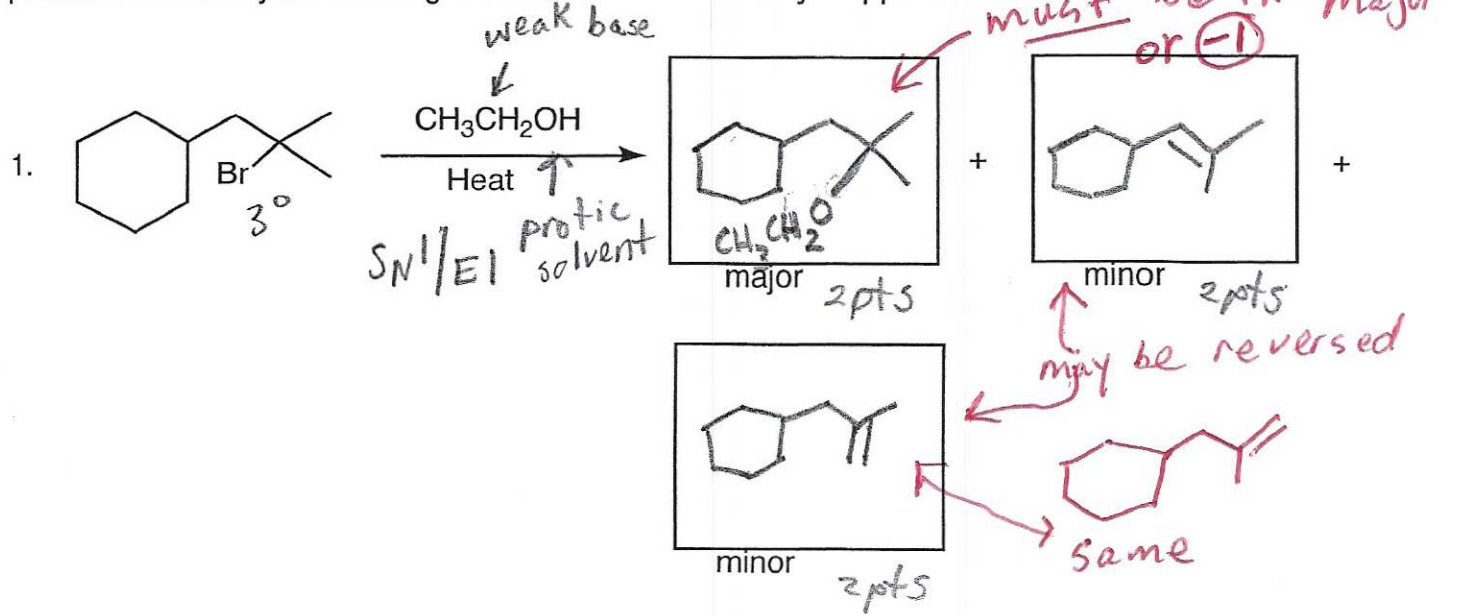
double bond to bridgehead would be unstable



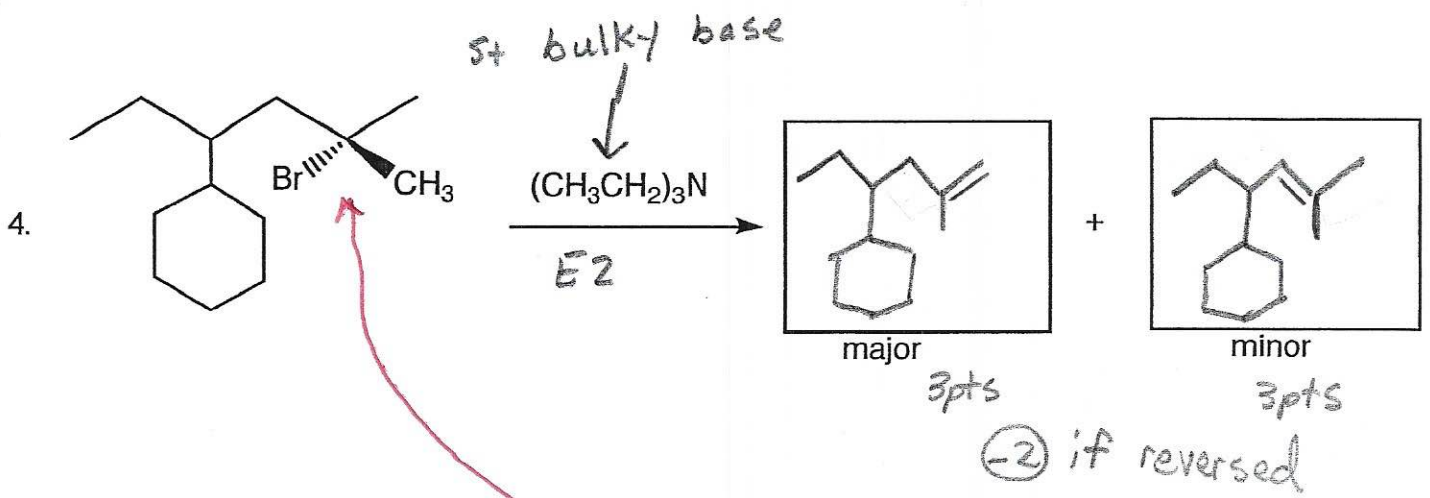
C. Reactions: Total = 36 points

Please provide an organic product in each answer box. If only one box is provided, give the major product. Be sure your drawing indicates stereochemistry if applicable.

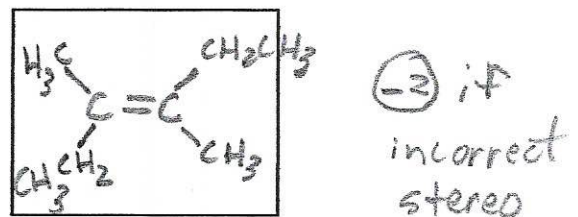
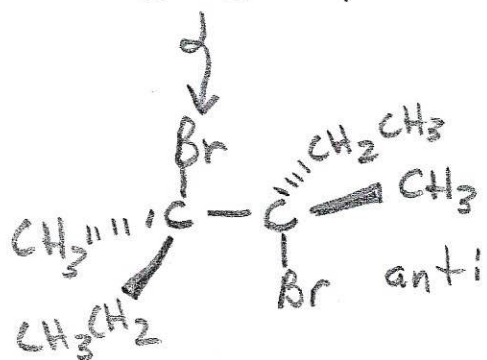
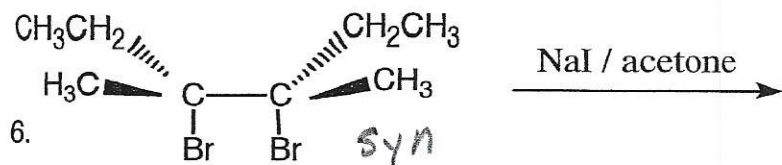
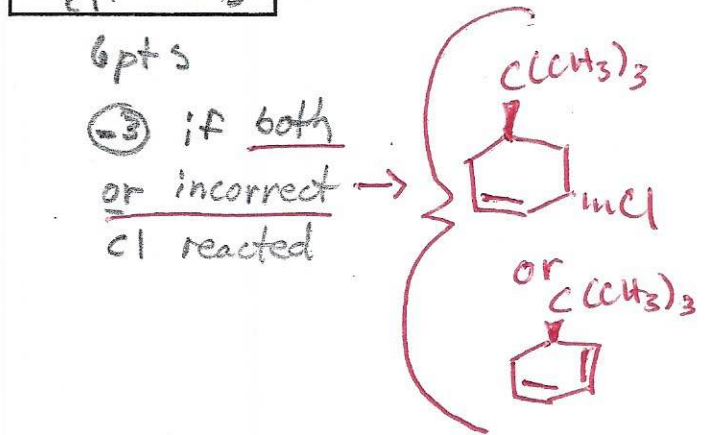
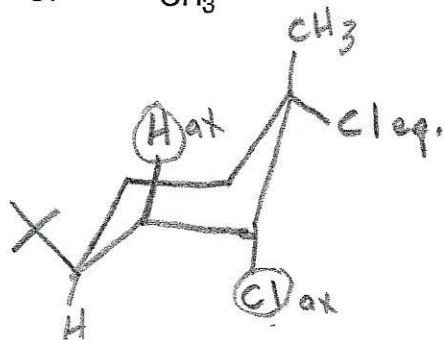
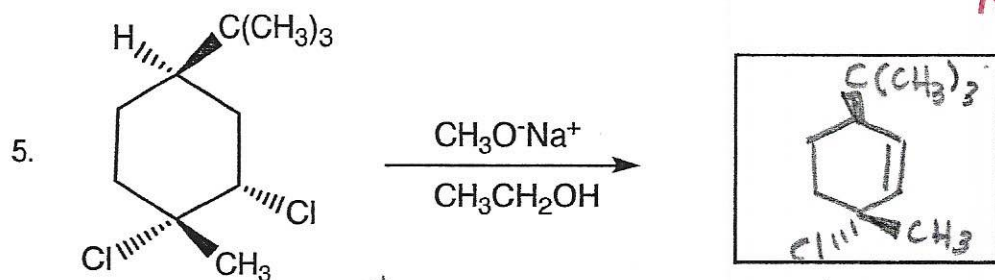
*only grade the boxes*







NO credit for substitution of  $3^\circ$  halide with bulky nucleophile



NO credit for substitution

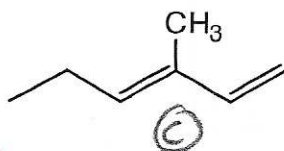
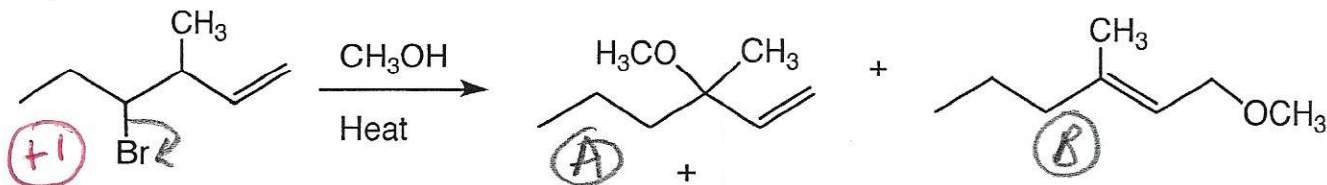


D. Mechanism: (10 points)

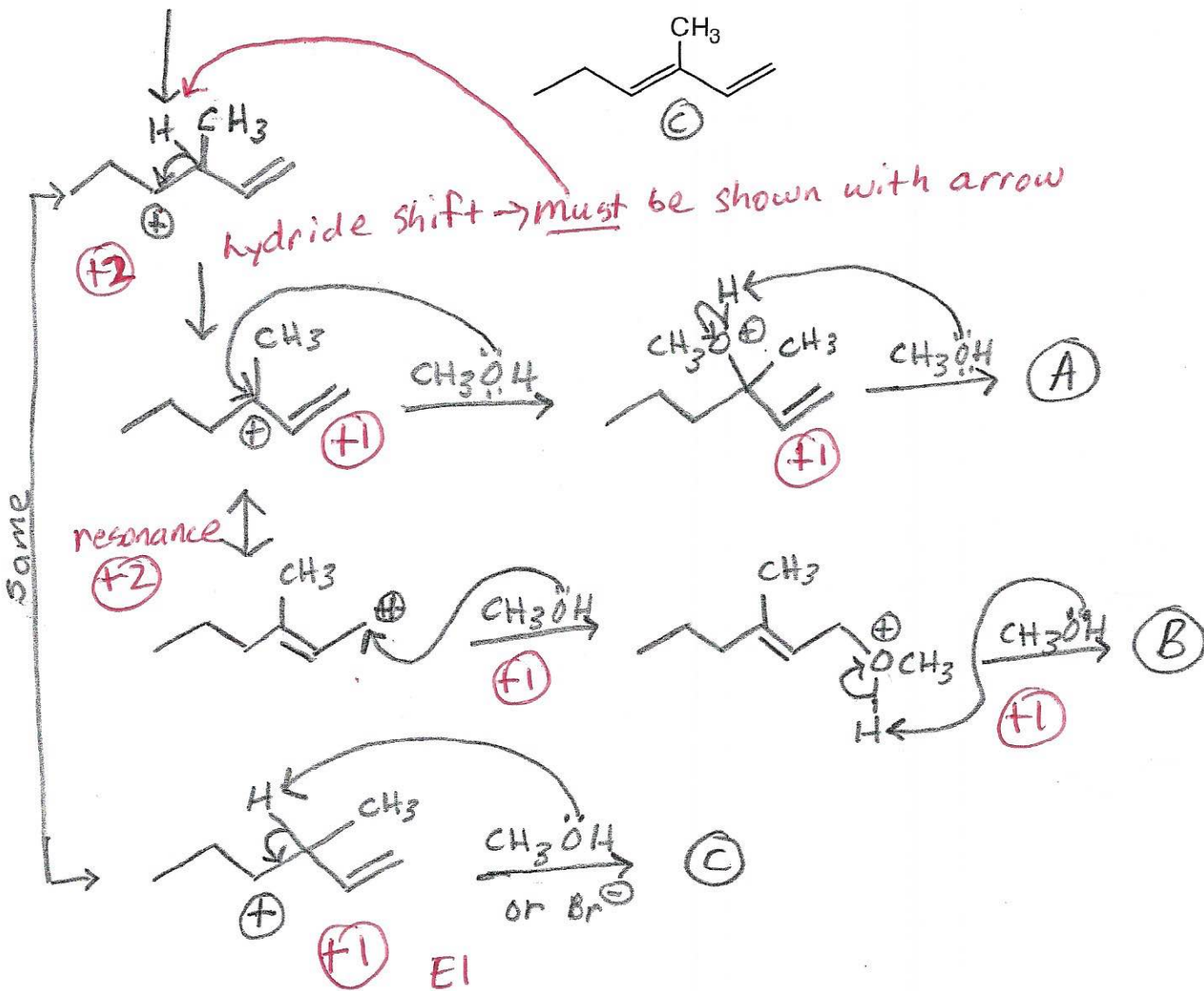
*three*

The reaction presented below produces several products. Provide clear mechanisms to explain the formation of the ~~two~~ products shown. Use curved arrows to indicate "electron flow". Remember to show only one step at a time. Show all intermediates and all formal charges. Please do not show transition states.

*Need proper arrows → NOT →*



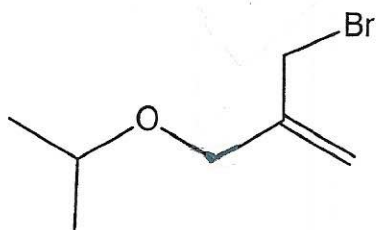
*hydride shift → must be shown with arrow*



**E. Synthesis:** (10 points)

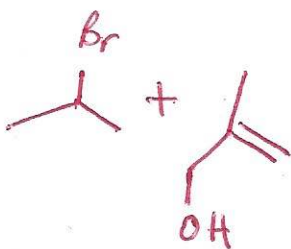
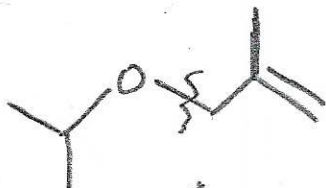
Synthesize the molecule below from alkanes of four carbons or less, and any inorganic reagents.

(Please do not include mechanisms!)

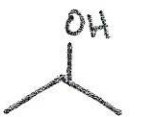


must be done last step

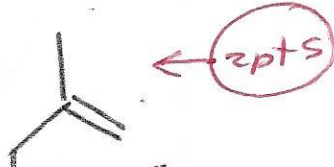
2pts



OK



X5



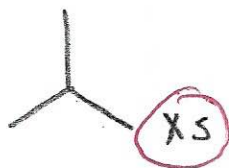
2pts



+ OK or any strong base  
EtO<sup>⊖</sup> CH<sub>3</sub>O<sup>⊖</sup> OH



if 2-bromopropane (-1)



X5

- missing both X5 → (-1) total

- incorrect Br<sub>2</sub> use, penalize once (-1)

- incorrect NBS use, penalize once (-1)

