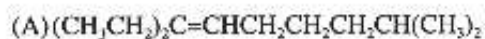
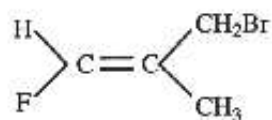


Name: _____

1. (10 points) Write correct IUPAC names or draw the structures as necessary.



(B)



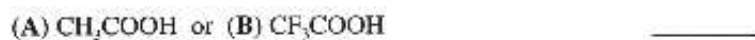
(C) *trans*-3-methylcyclohexanol (most stable conformation)

2. (14 points) For each of the following pairs place the letter **A** or **B** in the space at the right to indicate the appropriate answer to the question.

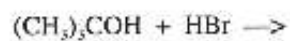
(i) Identify the stronger base in each pair shown below:



(ii) Identify the stronger acid in each pair shown below:



Complete the following acid-base reaction:



Name: _____

3. (16 points)

(i) Arrange the following alcohols in order of their decreasing reactivity with HBr (most reactive first). Draw the structures CLEARLY to receive partial credit.

- A. 1-Methylcyclopentanol
- B. Cyclopentylmethanol
- C. 2-Methylcyclopentanol

Decreasing reactivity: $_ > _ > _$

(ii) Arrange the following carbocations in order of their decreasing stabilities (most stable first). Draw the structures CLEARLY to receive partial credit.

- A. 1-Ethylbutyl cation
- B. Pentyl cation
- C. 1-Methylcyclohexyl cation

Decreasing stability: $_ > _ > _$

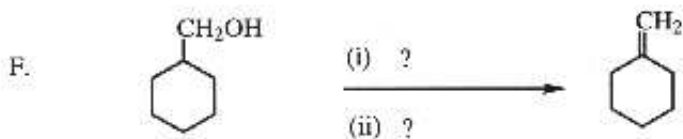
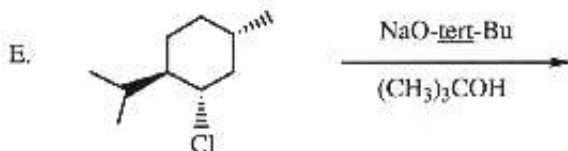
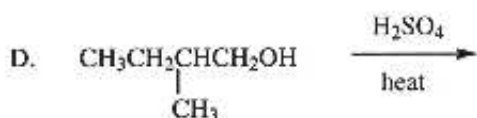
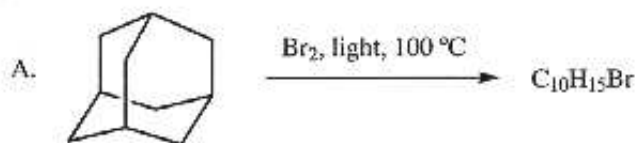
(iii) Arrange the following alkenes in order of their increasing heats of hydrogenation (lowest heat of hydrogenation first). Draw the structures CLEARLY to receive partial credit.

- A. *cis*-2-pentene
- B. 2-methyl-2-butene
- C. 1-pentene
- D. *trans*-2-pentene

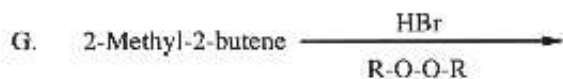
Increasing heats of hydrogenation: $_ < _ < _ < _$

Name: _____

4. (24 points) Draw clearly the structure (including stereochemistry where appropriate) of the major organic product in each of the following reactions:



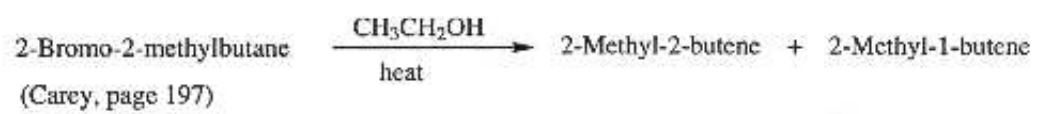
(Best method using a two-step process)



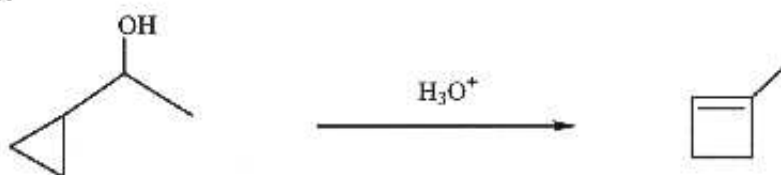
Name: _____

5. (16 points) Using the arrow formalism, draw a detailed, stepwise mechanism for each of the following reactions:

A.

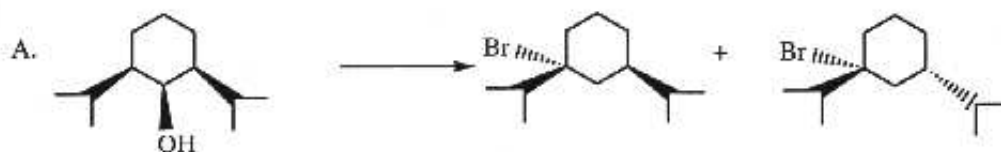


B.



Name: _____

6. (13 points) Showing all reagents and intermediate compounds, propose a reasonable synthesis of each product shown below, starting with the reactant specified in the question.



B. Isobutyl iodide \rightarrow t-Butyl iodide (Carey, page 254, question 6.32 g)

Name: _____

7. (7 points) Draw a picture showing the orbitals in the transition state for concerted E2 elimination of an alkyl halide.