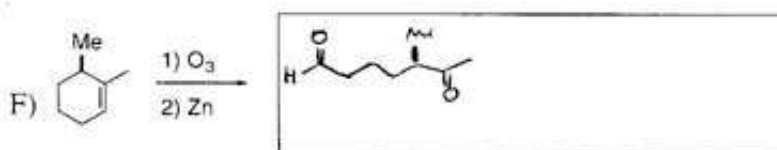
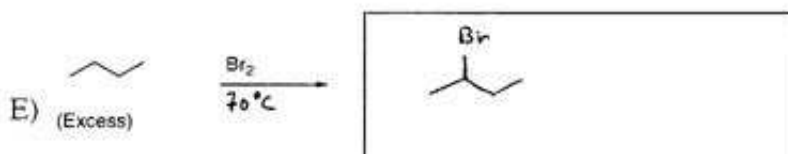
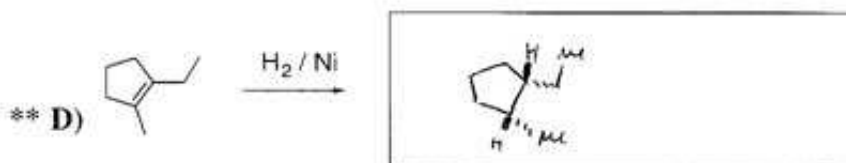
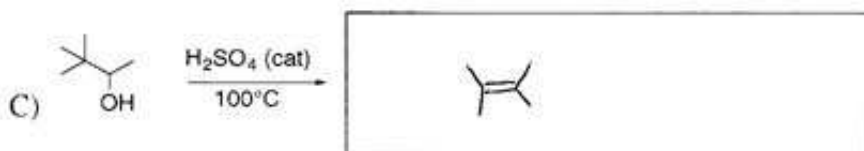
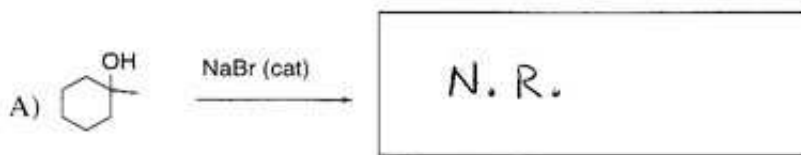
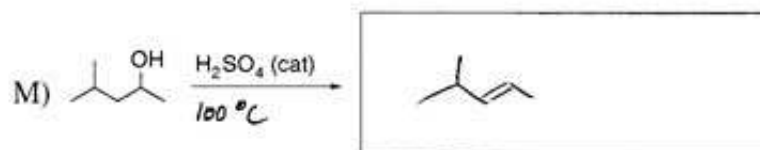
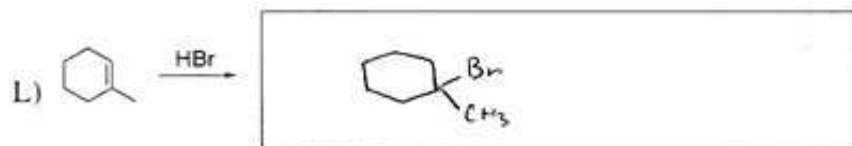
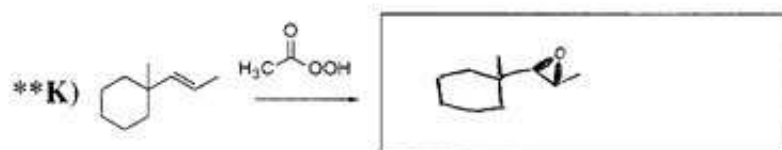
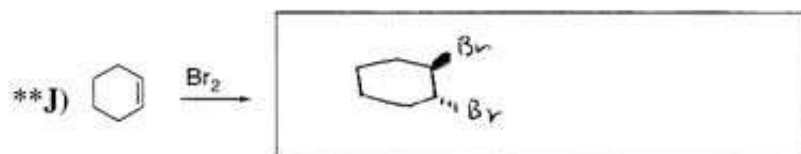
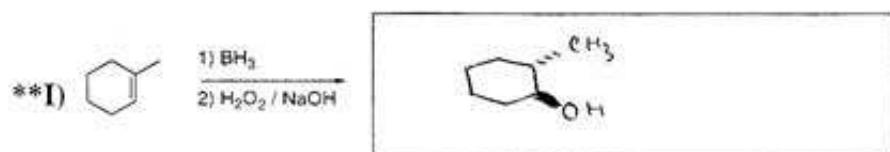
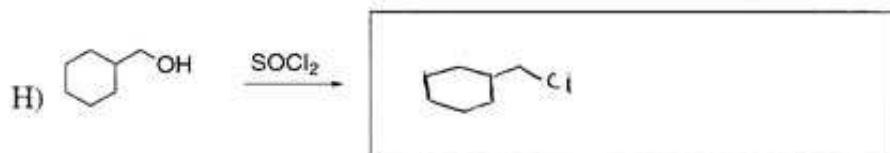
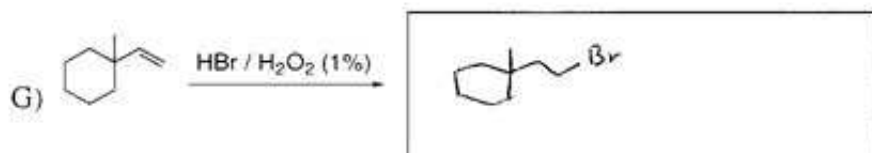
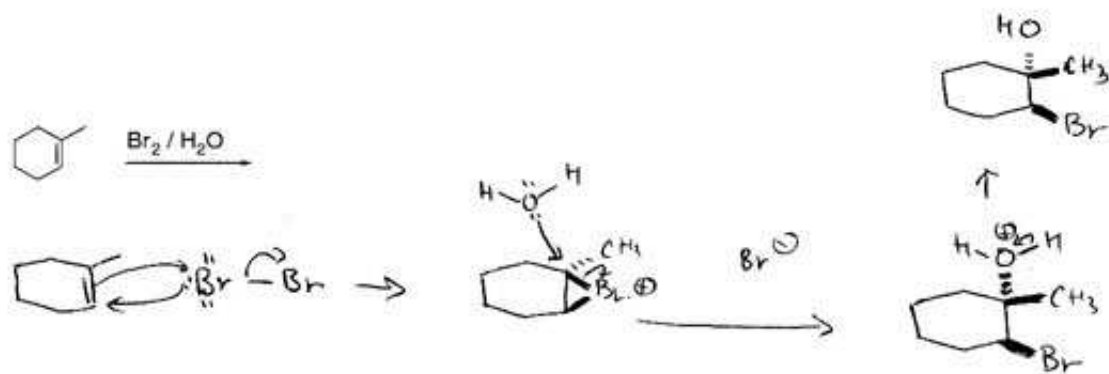
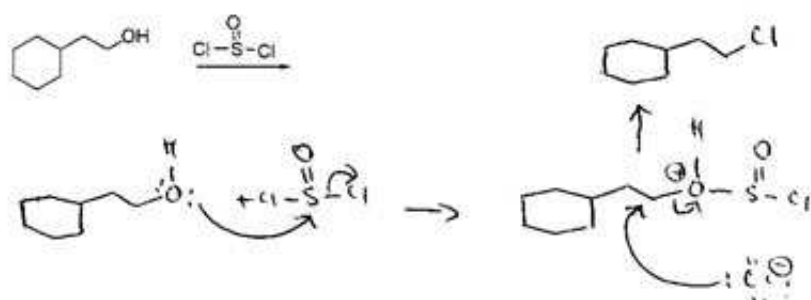
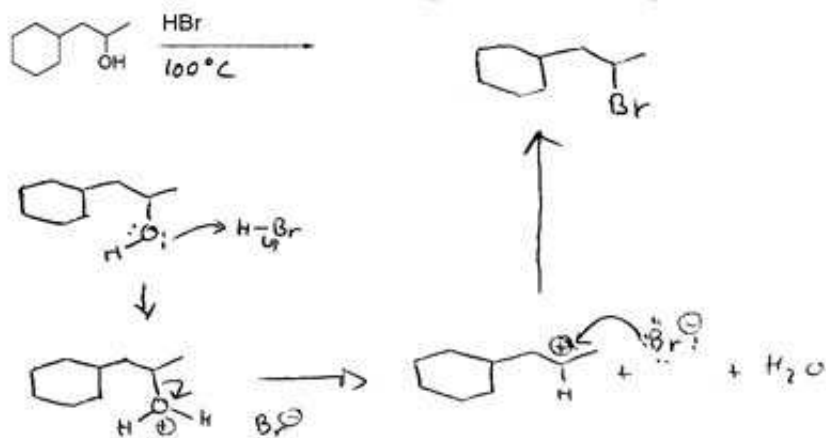


1) Provide the products of the following reactions. If no reaction would occur, then write NR. Also, for the questions labeled with a \*\*, indicate the stereochemistry of the products by drawing bold or dashed lines as appropriate. (4 or 5 points each).



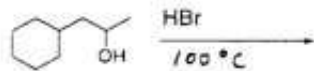


3) Provide the products and mechanisms for the following reactions. Please show every intermediate and all the arrows required for each step of the reaction (8 points each).

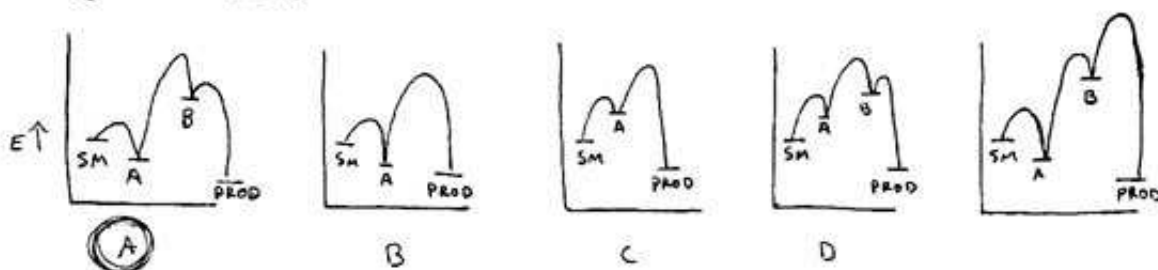


Multiple choice: Circle all the correct statements. Note that there may be more than one correct statement for each question

1) Which energy diagram best represents the mechanism of this reaction?



A + B = intermediates in the reaction



3) Certain reactions sometimes undergo rearrangements of a reactive intermediate. These rearrangements typically occur

- A) from a secondary cation to a tertiary cation
- B) from a tertiary cation to a secondary cation
- C) from a secondary radical to a tertiary radical
- D) from a tertiary radical to a secondary radical
- E) from a secondary cation to a tertiary radical.

5) Zaitsev's rule states that

- A) cations will migrate to the more stable cation
- B) dehydration reactions proceed by an E1 mechanism in strong acid
- C) the more stable alkene is formed in an elimination reaction
- D) more substituted cations are more stable
- E) less substituted cations are more stable

6) Which of the following reactions proceed via carbocation intermediates?

- A) E1
- B) E2
- C) SN1
- D) SN2
- E) The addition of HBr in the presence of peroxides
- F) The hydroboration / oxidation of an alkene

7) Which of the pictures shown below best represents hydrogen bonding (the dashed line represents the hydrogen bonding interaction)?

