12A Exam 2

Read Carefully! All work must be shown & it must be neat, organized, & large enough to read! Good luck!

1. Name the following alkenes (include stereochemistry if necessary)
2. Draw the structures of the molecules indicated. Proper shape is required!
   1. (2Z,4Z)-1-chloro-3-methyl-2,4-hexadiene
   2. (3Z, 5E)-4-methyl-3,5-nonadiene
3. What are the Names of the following symbols, Indicate the appropriate sign (+/-) for Favorable conditions, AND give an example of a reaction for each.
   1. ∆H
      1. Name =
      2. Sign =
      3. Reaction Example:
   2. ∆S
      1. Name =
      2. Sign =
      3. Reaction Example:
4. Draw a Reaction Energy Diagram for the following spontaneous reaction: 1-butene + hydrobromic acid. You must CLEARLY label in the appropriate position on the graph, the following:
   1. R: Reactants (& show structures on your graph)
   2. I: Intermediates (& show structures on your graph)
   3. P: Products (& show structures on your graph)
   4. T: transition state(s)
   5. ∆G of all STEP(s): & indicate sign + or –
   6. ∆G overall: indicate sign + or – AND label as Endergonic or Exergonic
   7. Ea: Activation Energy
5. Show the MECHANISM for the formation of the major product in the following reactions– must be neat & clear. Every arrow, formal charge, bond, lone pair, etc… must be shown for the reacting parts of the molecules. Watch your stereochemistry if necessary.
   1. Acid-Catalyzed Addition of H2O to 3,3-dimethyl-1-pentene
   2. Br2/methanol + 1-methyl-1-cyclohexene
6. What is the major product of the following reactions? Watch your stereochemistry if necessary. Your final answer must be circled. No mechanisms will be graded here.
7. Draw the Molecular Ion of butyl isopropyl ether TWICE, AND then show the homolytic cleavage MECHANISMS that occur. EXPLAIN which fragment will be the base peak.
8. PROVE the structure of the molecule that results from the following mass spec. Your work must be clear & organized. All work must be shown. You must show the structure of all peaks marked with \*. Any random guesses will not receive credit.

BONUS: Determine the structure of the molecule below. Work must be proved like in question 8.