

Organic 212
Assignment # 1

Name: _____

1) Write structural formulas for each of the following.

a) 3,4-Octadiene

b) (E,E)-3,5-Octadiene

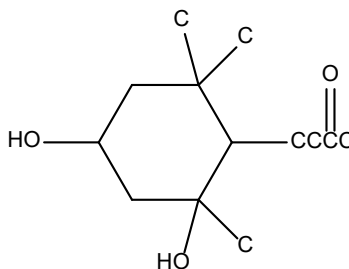
c) (Z,Z)-1,3-Cyclooctadiene

d) (Z,Z)-1,4-Cyclooctadiene

e) trans-1,2-Divinylcyclopropane

f) 2,4-Dimethyl-1,3-pentadiene

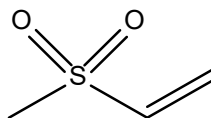
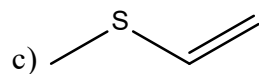
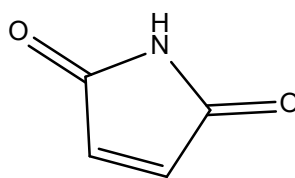
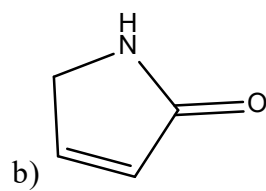
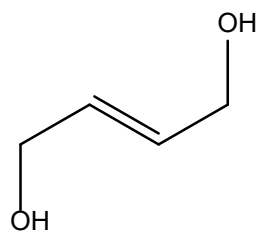
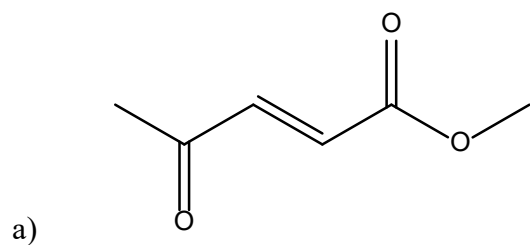
2) A certain species of grasshopper secretes an allenic substance of molecular formula $C_{13}H_{20}O_3$ that acts as an ant repellent. The carbon skeleton and location of various substituents in this substance are indicated in the partial structure below. Complete the structure, adding double bonds where appropriate.



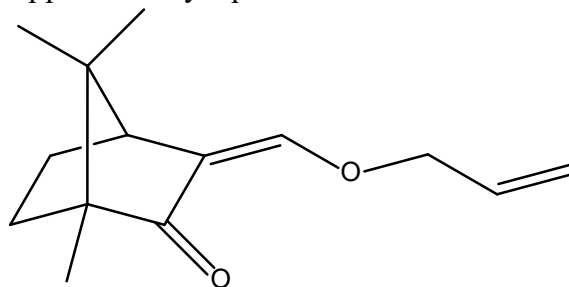
3) The pK_a of $CH_3CH=CHCH=CH_2$ has been estimated to be about 35. Give the structure of its conjugate base and use resonance to show the sharing of negative charge among the various carbons.

4) Bromination of 1,5-cyclooctadiene with N-bromosuccinimide (NBS) gives a mixture of two constitutional isomers of $C_8H_{11}Br$. Suggest reasonable structures for these isomers AND give an explanation as to how they are formed.

5) Identify the more reactive dienophile in each of the following pairs. Explain your answer.



6) Heating the compound shown below at 220 °C gave a mixture of two stereoisomeric Claisen rearrangement products in approximately equal amounts. Write a structural formula for each.



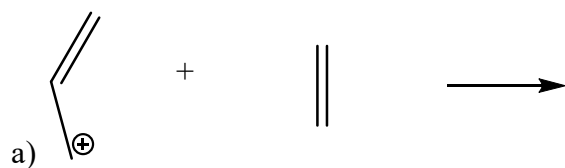
7) Suggest reasonable explanations for each of the following observations.

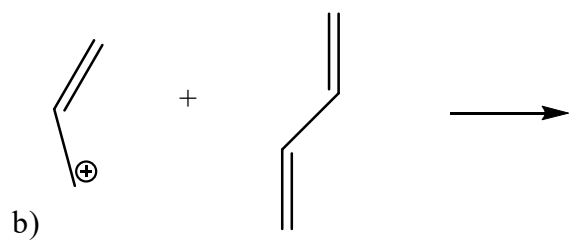
a) The first-order rate constant for the solvolysis of $(\text{CH}_3)_2\text{C}=\text{CHCH}_2\text{Cl}$ in ethanol is over 6000 times greater than that of allyl chloride at 25 °C.

b) After a solution of 3-buten-2-ol in aqueous sulfuric acid has been allowed to stand for 1 week, it was found to contain both 3-buten-2-ol and 2-buten-1-ol

c) Treatment of $\text{CH}_3\text{CH}=\text{CHCH}_2\text{OH}$ with hydrogen bromide gave a mixture of 1-bromo-2-butene and 3-bromo-1-butene.

8) Are the following reactions allowed or forbidden by Woodward-Hoffman rule? Explain your answer.





9) What is the 1,3-dipolar cycloaddition product formed in the reaction between diazomethane and maleic anhydride?

10) The nitron shown below undergoes an intramolecular 1,3-dipolar cycloaddition. What is the product?

