Self Test 2 (Units 6-8)

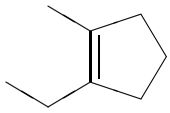
1. Provide structures for the following compounds:

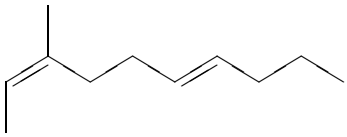
   a. 3-methyl-4-phenylbut-1-ene

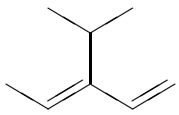
   b. 5-ethyl-1-methylcyclohexene

   c. 2,4-dimethylnona-l,3,7-triene

2. Provide complete IUPAC names for the following compounds, including stereochemical designations (i.e., *E* or *Z*) where appropriate.

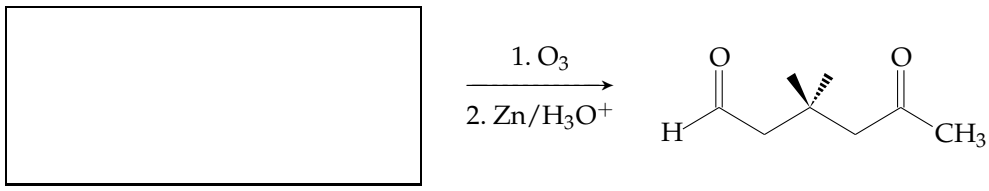
a. 

b. 

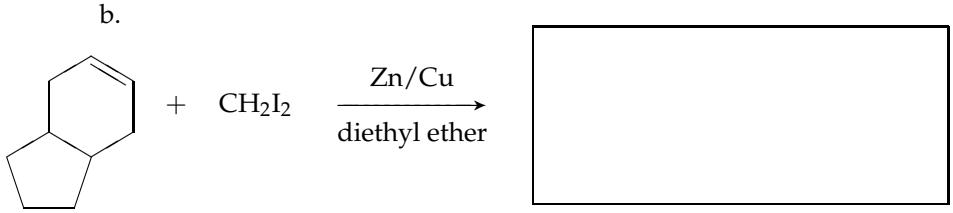
c. 

3. For each of the following reactions, provide the missing starting material, reagent or product. Indicate any stereochemistry where appropriate.

a.



b.



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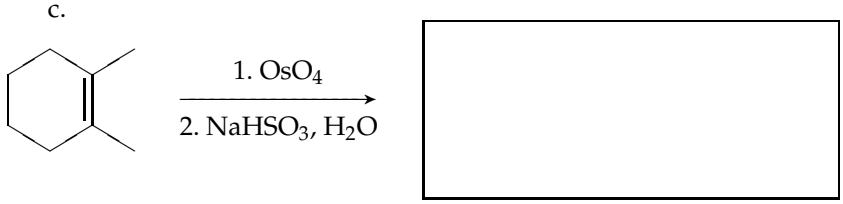
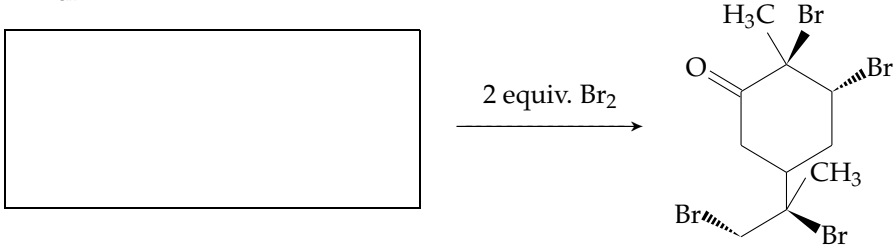
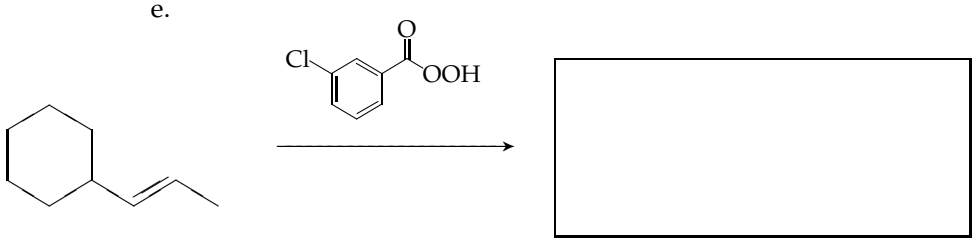


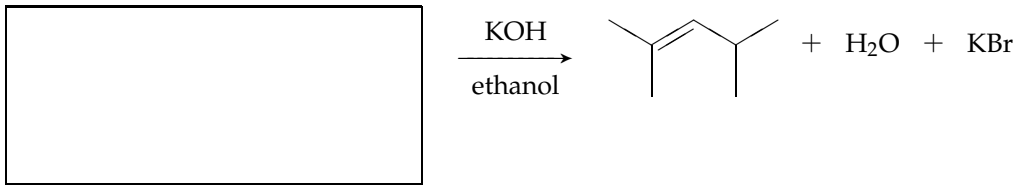
d.


2 equiv. Br_2
H_3C Br
O
Br
CH_3
Br
Br

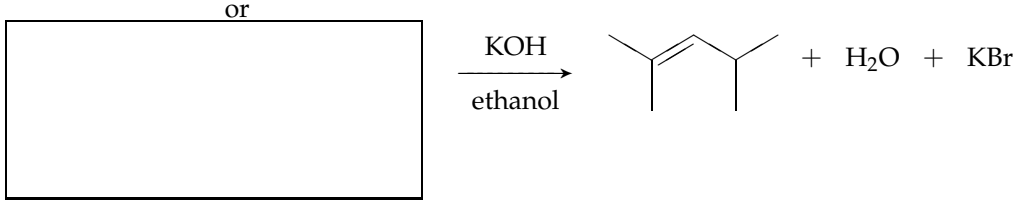
e.


Cl
O
OOH

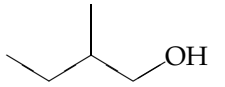
f.


KOH
ethanol
+ H_2O + KBr

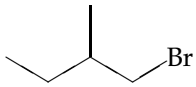
or

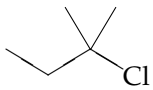

KOH
ethanol
+ H_2O + KBr

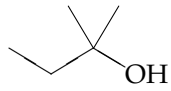
4. Using 2-methyl-l-butanol (shown below) as your only organic starting material, describe (using the appropriate chemical equations) how you would prepare each of the following products. You may assume that you have access to any necessary inorganic reagents. If multiple steps are required, be sure to show any organic intermediates.

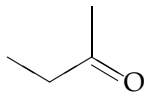


2-methyl-1-butanol

a. 

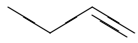
b. 

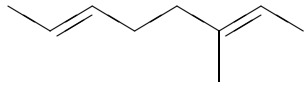
c. 

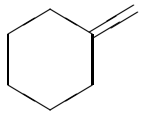
d. 

+ CO_2

5. For each of the following compounds, draw the most stable carbocation that can be formed on addition of a single H^+ ion.

a. 

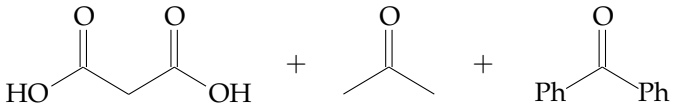
b. 

c. 

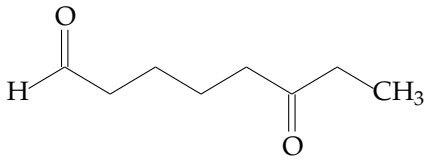
6. Indicate the alkene starting material as well as any reagents, conditions, or both, required to generate the following products via oxidative cleavage.

a.

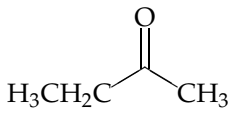
b.



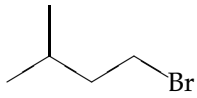
c.



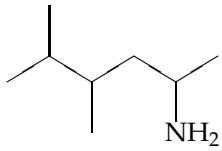
7. a. Mark the electrophilic atom with an asterisk.



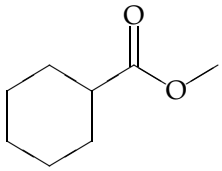
b. Mark the electrophilic atom with an asterisk.



c. Mark the nucleophilic atom with an asterisk.



d. Mark the atom bearing a significant partial negative charge with an asterisk.



8. Consider the following terms and match the most appropriate term to each of the given descriptions by placing the corresponding letter in each blank.

A	polarization	F	substitution reaction
B	addition reaction	G	nucleophile
C	conformation	H	radical reaction
D	electrophile	I	elimination reaction
E	polar reaction	J	heterolytic bond cleavage

a. The situation in which both bonding electrons end up on the same fragment upon bond cleavage is called _____.

b. A(n) _____ possesses a positively polarized electron-deficient atom which may form a new bond by accepting a pair of electrons.

c. A(n) _____ involves unpaired electrons often resulting from bond-breakage promoted by irradiation with ultra-violet light.

d. A(n) _____ often proceeds with the formation of two products from a single organic starting material. One of these two products is typically a very small molecule such as H_2O or HCl.