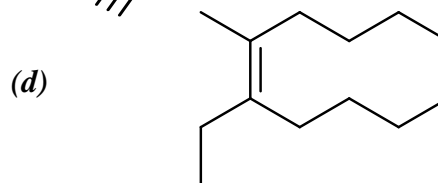
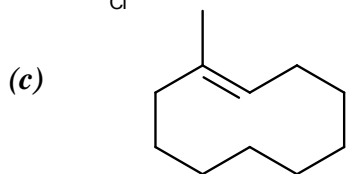
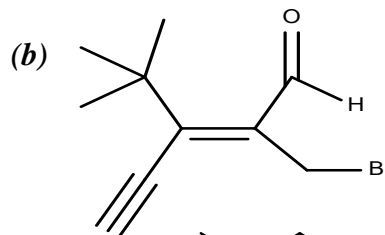
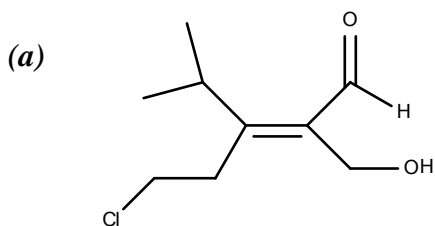


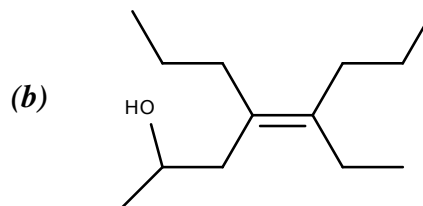
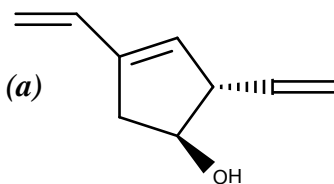
## Organic Chemistry Practice Problems

### Organic Chemistry I Practice Set #7 (Chapters 4-5 – Carey)

- 1) Apply the Cahn-Ingold-Prelog priority rules and assign the configuration (*E* or *Z*) of the CC double bond in each structure below.



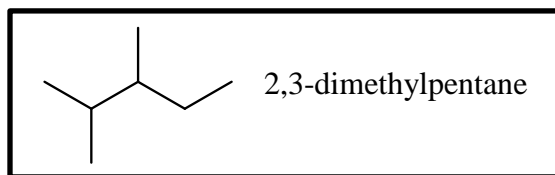
- 2) Name the following compounds



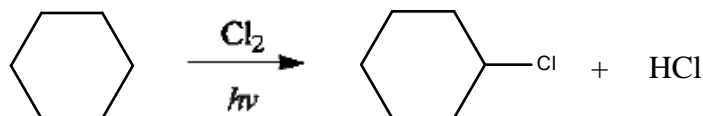
- 3) For each of the following, provide a structural formula.

(a) 1-ethyl-3-isopropyl-1-methyl-1-hexyl cation    (b) *trans*-4-[(*Z*)]-1-butenyl]cyclohexanol

- 4) (a) Draw all the different possible constitutionally isomeric monochloroalkanes that may result from the light-initiated reaction of chlorine with 2,3-dimethylpentane.  
(b) Consider **ONLY** the **primary** alkyl halide isomers (given in your answer above) and circle the **one** that is formed in the **greatest** amount.

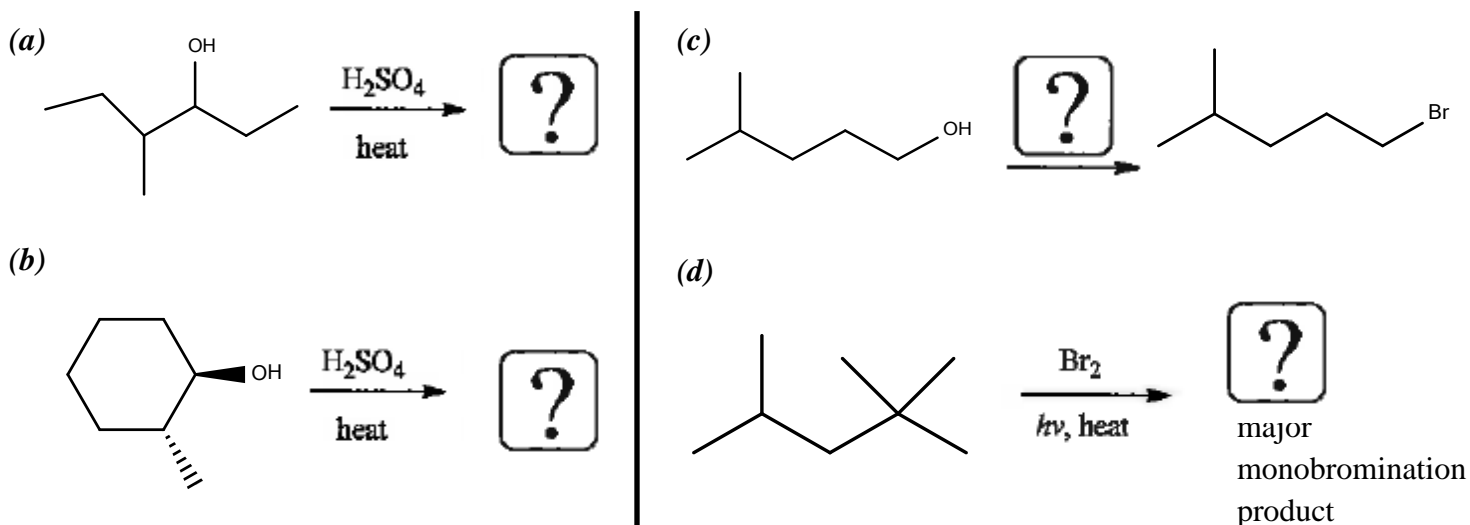


- 5) Using arrows to show the flow of electrons, write a stepwise mechanism for the following reaction. If the mechanism is a free-radical chain reaction, label each stem as either *initiation*, *propagation*, or *termination*; also give three *termination* steps.



## Organic Chemistry Practice Problems

- 6) (i) Which one is thermodynamically more stable: (a) 1-pentene (b) (Z)-2-pentene  
 (ii) Which compound has the lower heat of combustion: (a) (E)-cyclodecene (b) (Z)-cyclodecene  
 (iii) Which compound has the higher heat of combustion:  
 (a) (E)-cyclopentadecene (b) (Z)-cyclopentadecene  
 (iv) Which one is the major monobromination product of the reaction of 2-methylbutane with Br<sub>2</sub>, in the presence of heat and light: (a) 1-bromo-2-methylbutane (b) 1-bromo-3-methylbutane  
 (c) 2-bromo-3-methylbutane (d) 2-bromo-2-methylbutane  
 (v) Which is the top layer in a flask that contains both of the following: (a) water or (b) 1-bromohexane  
 (vi) Which one is thermodynamically more stable: (a) tert-butyl cation (b) isobutyl cation  
 (vii) When methylcyclohexane reacts with Br<sub>2</sub> in the presence of heat and light, does the major monobromination product involve the formation of which of the following:  
 (a) a primary radical (b) a secondary radical (c) a tertiary radical  
 (viii) What is the hybridization of C in the methyl radical: (a) sp<sup>3</sup> (b) sp<sup>2</sup> (c) sp
- 7) Fill in what is missing. Either give all of the missing reagents to complete the reaction or give a structural formula for the **major organic product(s)**. Show stereoisomers properly if necessary. If no reaction occurs, write **N.R.**

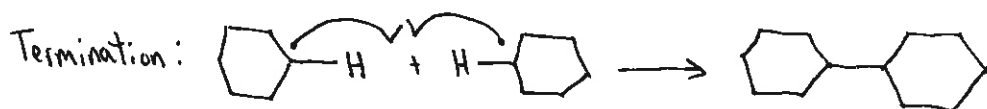
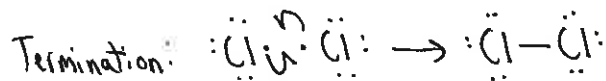
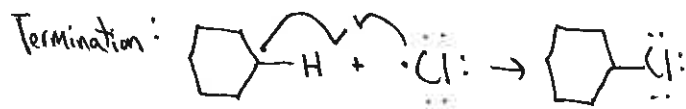
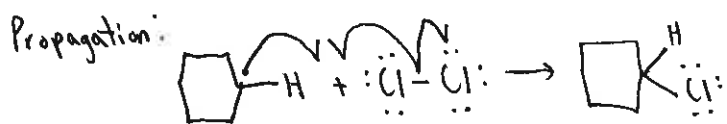
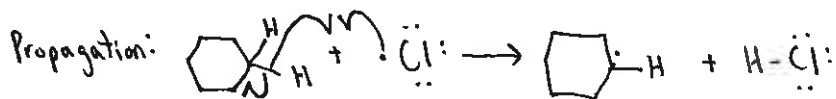
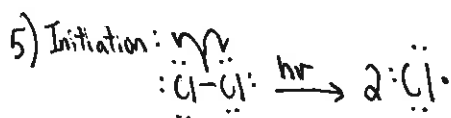
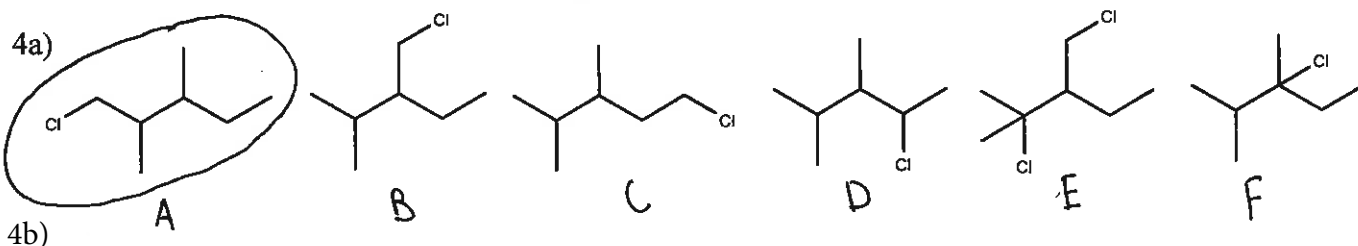
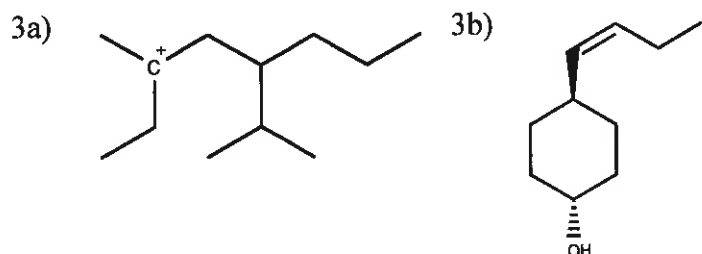


## Organic Chemistry Practice Problems

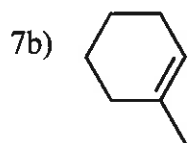
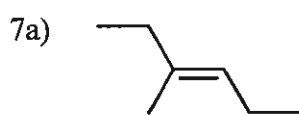
### Organic Chemistry I Answers to Practice Set #7 (Chapters 2-4 – Carey)

1a) Z 1b) Z 1c) E 1d) Z

2a) trans-2,4-divinylcyclopent-3-enol 2b) (E)-5-ethyl-4-propyl-oct-4-en-2-ol



6i) b 6ii) b 6iii) b 6iv) d 6v) a 6vi) a 6vii) c 6viii) b



7c)  $\text{PBr}_3$  7d)

