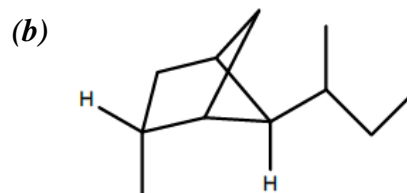
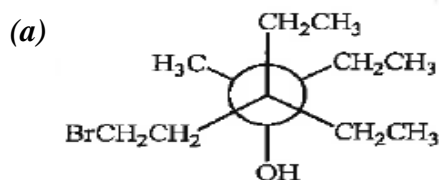


## Organic Chemistry Practice Problems

### Organic Chemistry I Practice Set #6 (Chapters 2-4 – Carey)

- 1) For each of the following compounds, provide a name. When necessary, be sure to designate appropriately each configuration (*cis*, *trans*, *endo*, *exo*, *syn*, *anti*) properly in the name.

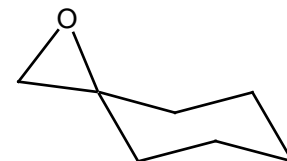
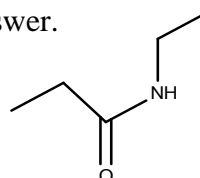
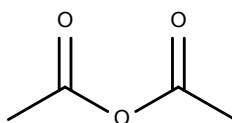
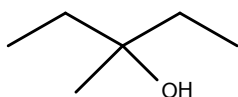
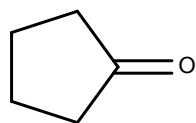


- 2) For each of the following, provide a structural formula. When necessary, be sure to designate appropriately each configuration (*cis*, *trans*, *endo*, *exo*, *syn*, *anti*) properly.

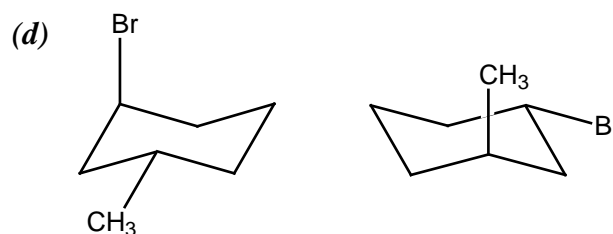
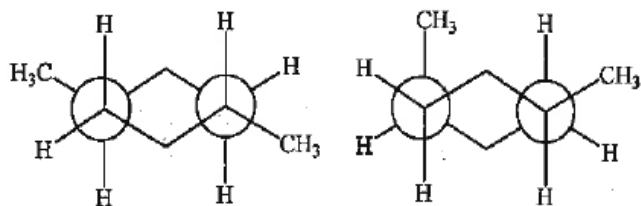
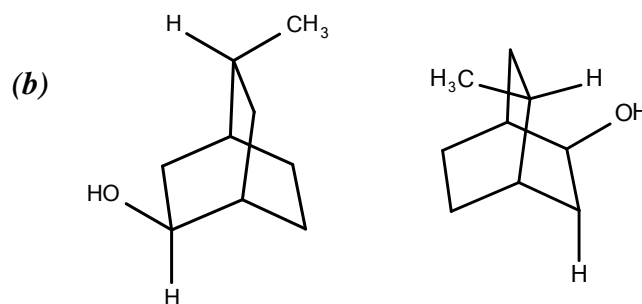
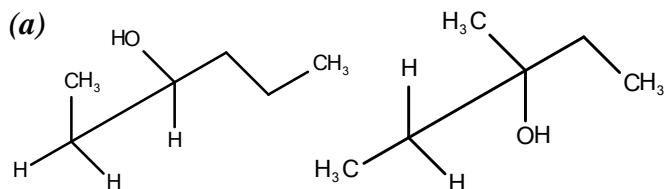
(a) piperidine

(b) spiro[3.4]octane

- 3) Give the name of the functional group class for each of the compounds given below. Be as specific as possible. Note that **carbonyl group** is **NOT** an acceptable answer.

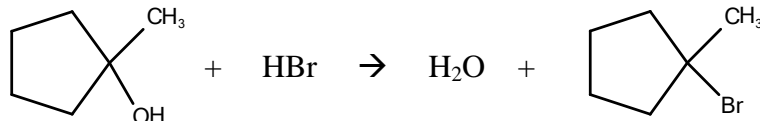


- 4) For each of the pairs shown below, give the best answer which describes the relationship between each molecule in the pair. Choose from: (i) **constitutional isomers**; (ii) **different conformations of the same compound**; (iii) **stereoisomers that cannot be interconverted by rotation about single bonds**; or (iv) **the same conformation of the same compound**.



## Organic Chemistry Practice Problems

- 5) Consider the following reaction. Using arrows to show the flow of electrons, write a stepwise mechanism for this reaction.



- 6) Using arrows to show the flow of electrons, write a stepwise mechanism for the reaction of 1-propanol with hydrogen iodide to make 1-iodopropane and water.

- 7) (i) What is the hybridization of the central C (also known as C2) in  $\text{H}_2\text{C}=\text{C}=\text{CH}_2$  :

(a)  $\text{sp}^3$  (b)  $\text{sp}^2$  (c)  $\text{sp}$  (d) s (e) p

- (ii) Which compound has the smaller heat of combustion:

(a) *cis*-1,3-dimethylcyclohexane (b) *trans*-1,3-dimethylcyclohexane

- (iii) Which compound has the lower boiling point:

(a)  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  (b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$

- (iv) Which compound is less soluble in water:

(a)  $\text{CH}_3(\text{CH}_2)_3\text{OH}$  (b)  $\text{CH}_3(\text{CH}_2)_4\text{OH}$

- (v) Which compound is more oxidized:

(a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  (b)  $\text{CH}_3\text{CH}_2\text{CO}_2\text{H}$

- (vi) Which compound is more dense in water:

(a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{F}$  (b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$  (c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$

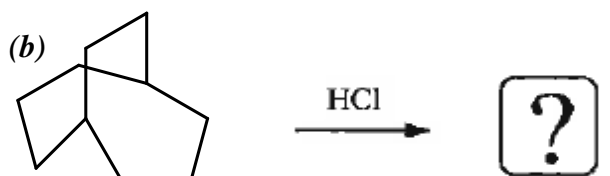
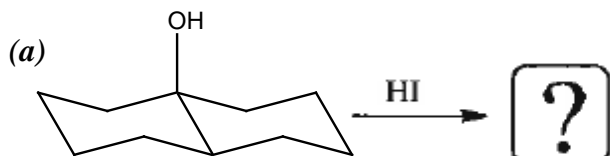
- (vii) Which compound has a lower boiling point:

(a)  $\text{CH}_3\text{CH}_2\text{F}$  (b)  $\text{CF}_3\text{CF}_3$

- (viii) Which compound has a smaller heat of combustion:

(a) ethylcyclohexane (b) propylcyclohexane

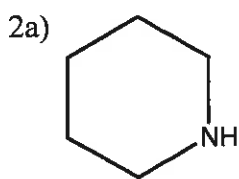
- 8) Fill in what is missing. Either give all of the missing reagents to complete the reaction or give a structural formula for the **major organic product(s)**. Show stereoisomers properly if necessary. If no reaction occurs, write **N.R.**



## Organic Chemistry Practice Problems

### Organic Chemistry I Answers to Practice Set #6 (Chapters 2-4 – Carey)

1a) 6-bromo-4,4-diethyl-3-methylhexan-3-ol 1b) 5-sec-butyl-2-methylbicyclo[2.1.1]hexane

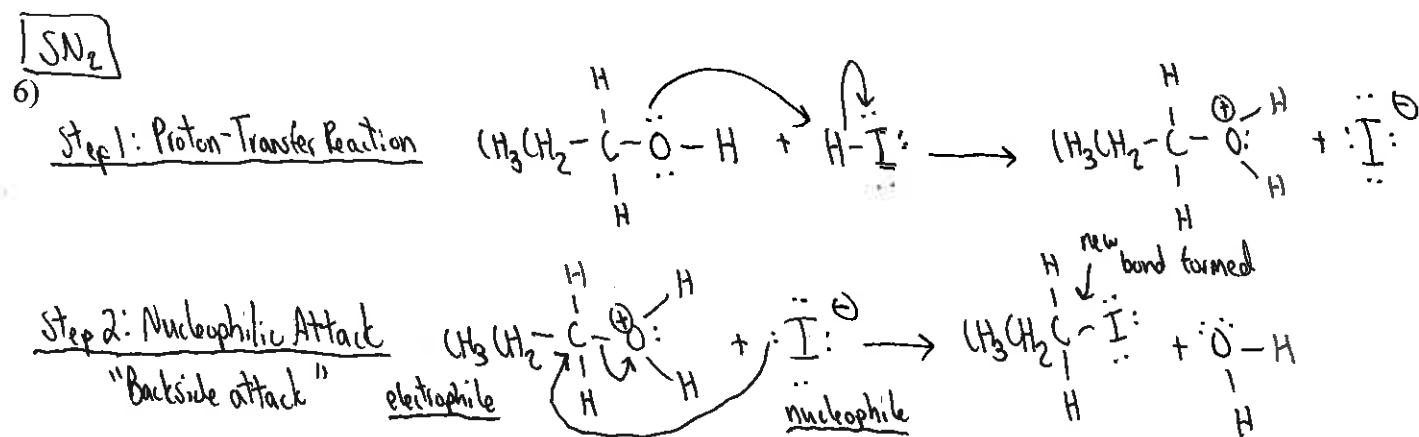
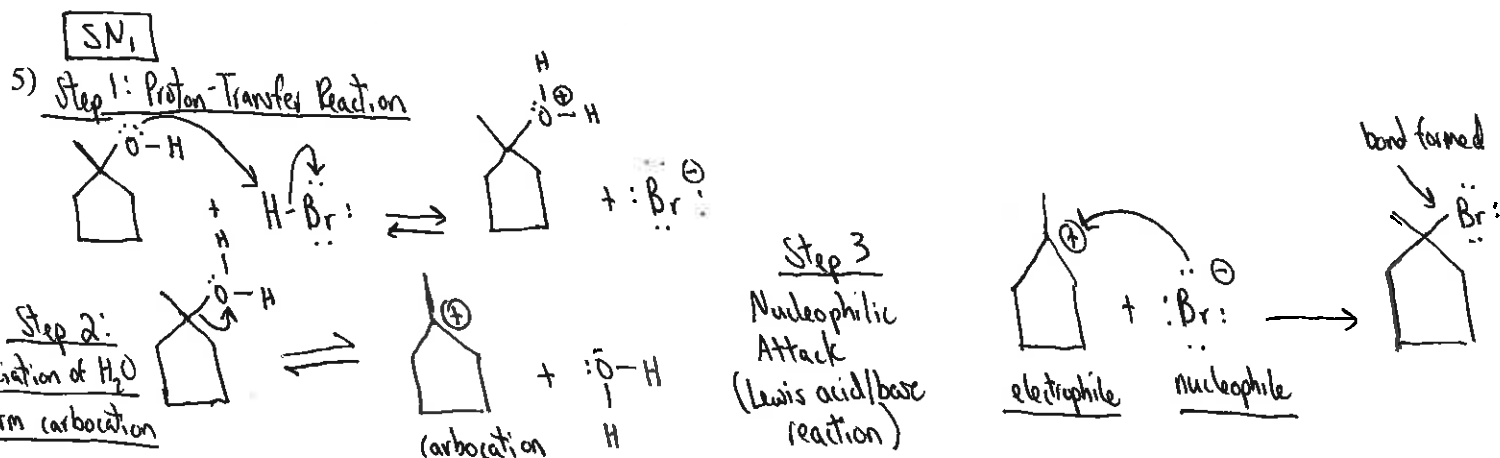


piperidine

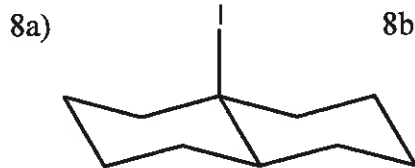


3a) tertiary alcohol 3b) ketone 3c) acid anhydride 3d) epoxide  
3e) secondary amide

4a) i 4b) iv 4c) iii 4d) ii



7i) sp 7ii) a 7iii) a 7iv) b 7v) b 7vi) c 7vii) b 7viii) a



8b) N.R. 8c) PBr<sub>3</sub> 8d) SOCl<sub>2</sub>

