

Third Exam

Chemistry 3331

November 21, 2014

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

ID# \_\_\_\_\_

PLEASE CIRCLE CLASS TIME!

10:00 AM

1:00 PM

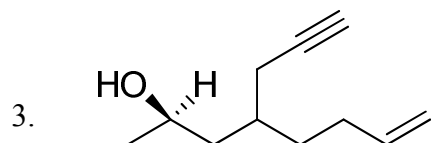
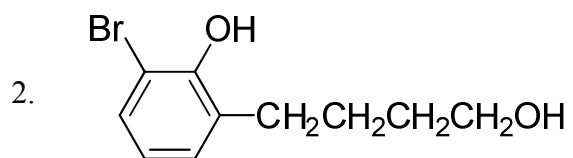
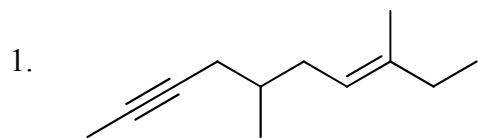
Page #	Score	
1. 15 pt		
2. 24 pt		
3. 18 pt		
4. 18 pt		
5. 12 pt		
6. 13 pt		

Total: \_\_\_\_\_

NOTE: Present your ID when you return the exam booklet.

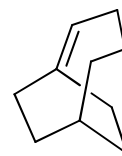
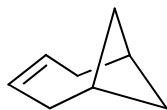
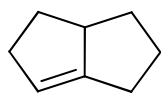
**A. Nomenclature:** (15 points)

Given an acceptable IUPAC name for each of the compounds. Be sure to indicate the **stereochemistry** where appropriate.

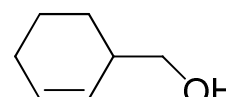
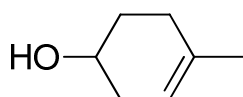


**B. Facts:** Total = 24 points

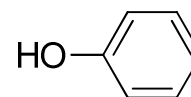
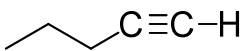
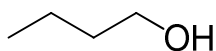
1. Label the alkenes as stable (S) or unstable (U). (6 points)



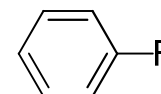
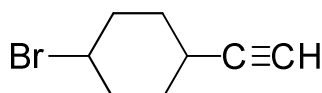
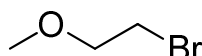
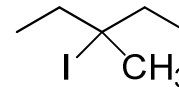
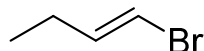
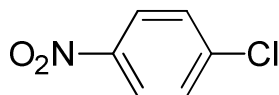
2. Place the alcohols in order of increasing reactivity in an acid catalyzed dehydration. (1=least reactive, 3=most reactive) (6 points)



3. Place a "Y" in the box below any compound that will be efficiently deprotonated by hydroxide (EQ to the right). Place an "N" in the box below any that will not. (6 points)



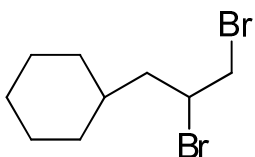
4. Place a "Y" in the box below any halide that will produce a useful Grignard reagent. Place an "N" in the box below any that will not (6 points)



**C. Reactions:** Total = 36 points, 6 points each

Please provide the major product or the reagents in the answer box. Be sure your drawing indicates stereochemistry if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below in the reaction.

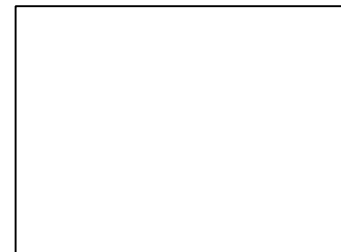
1.



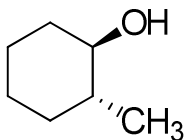
1. KOH/200 °C

2. Li / NH<sub>3</sub>

3. CHCl<sub>3</sub>/KOH



2.



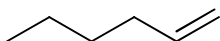
1. H<sub>2</sub>SO<sub>4</sub> / Heat

2. KMnO<sub>4</sub> (warm, conc.)

3. NaBH<sub>4</sub> / EtOH



3.

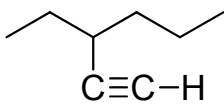


1. OsO<sub>4</sub>/H<sub>2</sub>O<sub>2</sub>/OH<sup>-</sup>

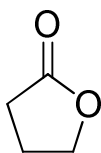
2. NaOCl



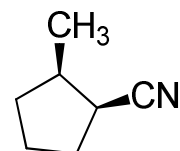
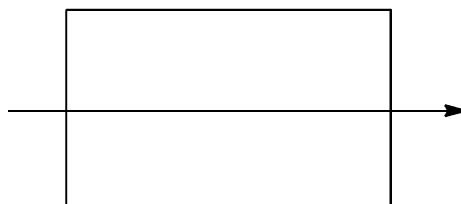
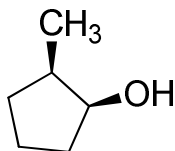
4.

1.  $\text{Si}_2\text{BH}$ 2.  $\text{H}_2\text{O}_2 / \text{OH}^-$ 3.  $\text{CH}_3\text{C}\equiv\text{C}:\bar{\text{Na}}^+$ , then  $\text{H}_3\text{O}^+$ 

5.

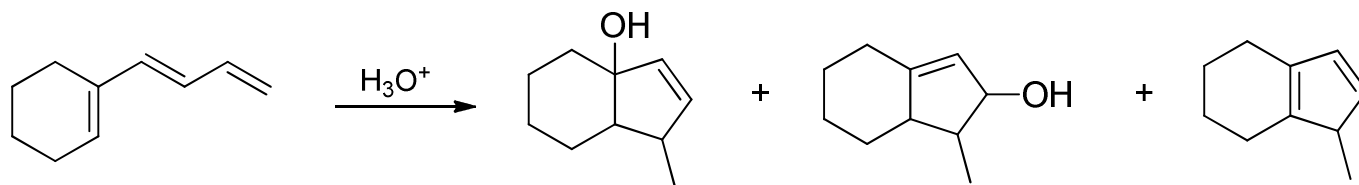
1.  $\text{MgBr}_{(\text{xs})}$ 2.  $\text{H}_3\text{O}^+$ 3.  $\text{Na}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4/\text{H}_2\text{O}$ 

6.



**D. Mechanism:** (12 points)

The reaction below produces a mixture of products. Provide clear mechanism to explain the formation of the products shown. Use curved arrows to indicate “electron flow”. Remember to show only one step at a time. **Show all intermediates and all formal charges.** **Do not show transition states.**



**E. Synthesis:** (13 Points)

Synthesize the molecule below from alkenes, alkynes, or alcohols of **three** carbons or less, any oxidizing or reducing agents, peroxyacids, and any other inorganic reagents. (Please do not include mechanisms.)

