

**CHM 1321          Second Midterm          Apr 1 – 2011**  
**(Prof. S. Gambarotta)**

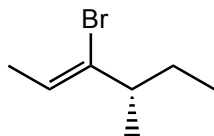
**Your Name:** \_\_\_\_\_

**Student #:** \_\_\_\_\_

<b>Exercise</b>	<b>key</b>	<b>Exercise</b>	<b>key</b>
<b>1</b>		<b>12</b>	
<b>2</b>		<b>13</b>	
<b>3</b>		<b>14</b>	
<b>4</b>		<b>15</b>	
<b>5</b>		<b>16</b>	
<b>6</b>		<b>17</b>	
<b>7</b>		<b>18</b>	
<b>8</b>		<b>19</b>	
<b>9</b>		<b>20</b>	
<b>10</b>			
<b>11</b>			

1. Deliver only the solution key in the above table. You can keep the text. The solution key will be posted today on the web.
2. You must respond to all exercises. Blank pages are at the end.
3. open book exam (only a clean textbook or printout of the E-text allowed)
4. molecular models are allowed

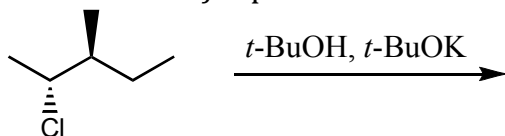
1. Name the following compound:



- A) (*S,Z*)-3-bromo-4-methylhex-2-ene  
 B) (*S*)-3-bromo-4-methylhex-2-ene  
 C) (*S,Z*)-4-bromo-3-methylhex-4-ene  
 D) (*S,E*)-3-bromo-4-methylhex-2-ene  
 E) (*R,E*)-3-bromo-4-methylhex-2-ene

Ans: A

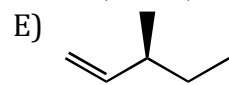
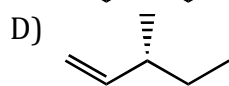
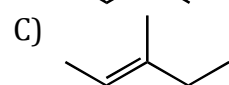
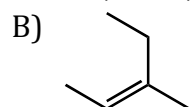
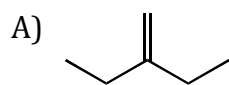
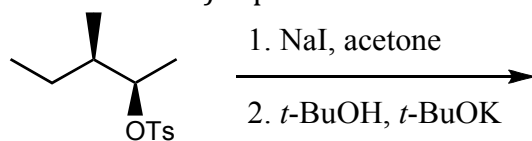
2. What is the *major* product for the following reaction?



- A)
- B)
- C)
- D)
- E)

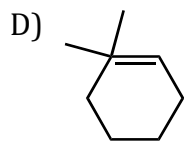
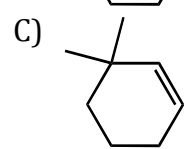
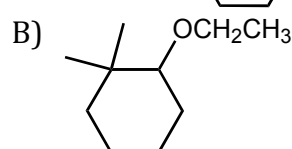
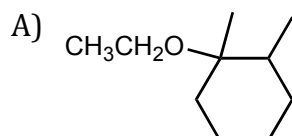
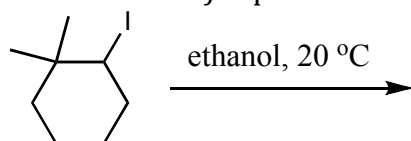
Ans: E

3. What is the *major* product for the following reaction?



Ans: ~~XXX~~ D

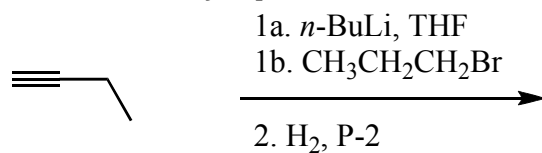
4. What is the *major* product of the reaction of the following reaction?

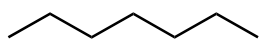
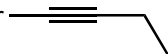
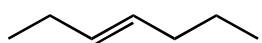
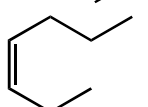


E) More than one of the above

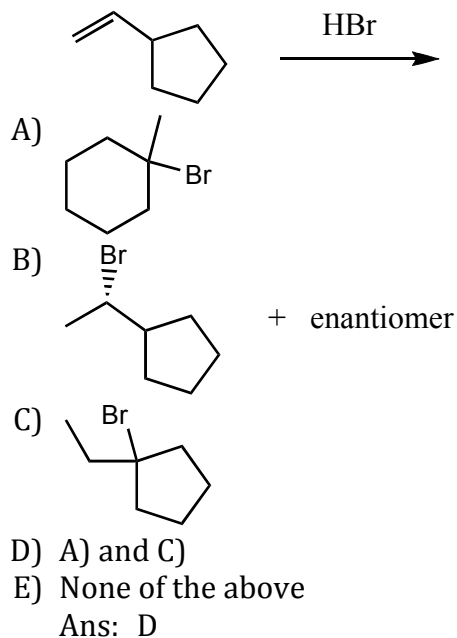
Ans: A

5. What is the *major* product for the following reaction sequence?

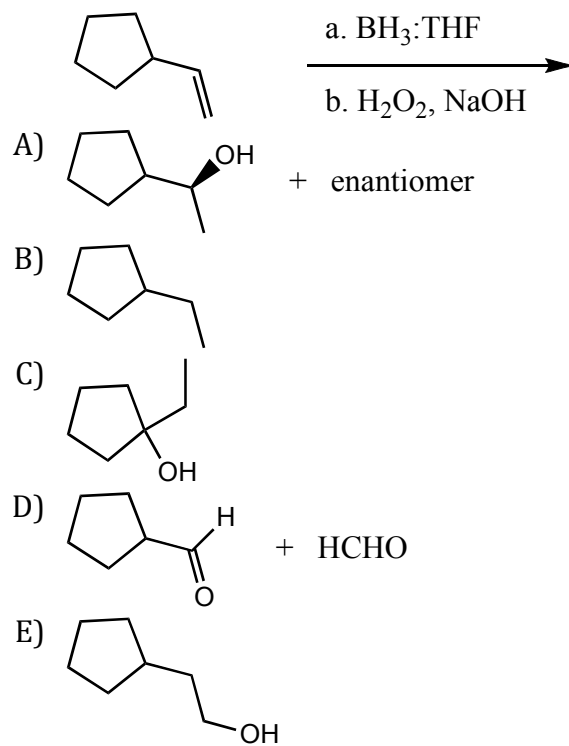


- A)   
 B) CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>Br   
 C)   
 D)   
 E) None of the above  
 Ans: D

6. What are possible products for the following reaction?

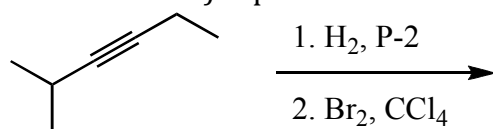


7. What is the *major* product for the following reaction?



Ans: E

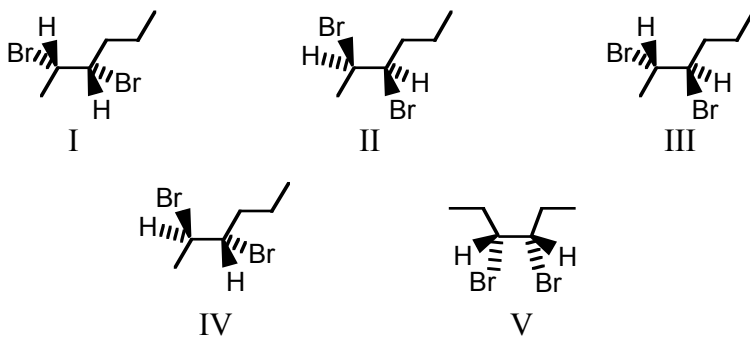
8. What is the *major* product of the following reaction sequence?



- A) + enantiomer
- B) + enantiomer
- C) + enantiomer
- D) + enantiomer
- E)

Ans: B

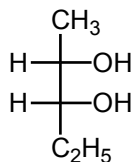
9. Reaction of *trans*-2-hexene with a solution of  $Br_2$  in  $CCl_4$  produces:



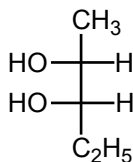
- A) I and II  
B) II and V  
C) III and IV  
D) IV and V  
E) V

Ans: C

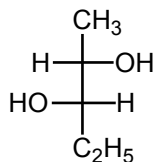
10. Hydroxylation of *cis*-2-pentene with cold alkaline  $\text{KMnO}_4$  yields



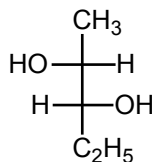
I



II



III

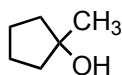
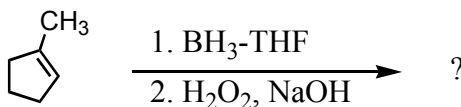


IV

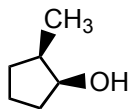
- A) Equal amounts of I and II  
 B) Equal amounts of II and III  
 C) Equal amounts of III and IV  
 D) I and II as major products, III and IV as minor products  
 E) All of the above in equal amounts

Ans: A

11. Which product(s) would you expect to obtain from the following sequence of reactions?



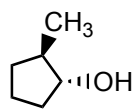
I



+

enantiomer

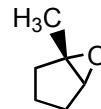
II



+

enantiomer

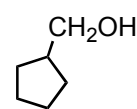
III



+

enantiomer

IV

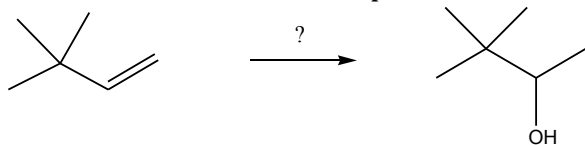


V

- A) I  
 B) II  
 C) III  
 D) IV  
 E) V

Ans: C

12. Which reaction can accomplish the following transformation in good yield:



- A)  $\text{H}^+/\text{H}_2\text{O}$
- B) oxymercuration/demercuration
- C) hydroboration/oxidation
- D) Reaction with  $\text{NaOH}$
- E) None of the above

Ans: B

13. Which would be the best method for converting 3,3-dimethyl-1-pentene into 3,3-dimethyl-2-pentanol?

- A)  $\text{H}_3\text{O}^+$ , heat
- B)  $\text{BH}_3\cdot\text{THF}$ ; then  $\text{H}_2\text{O}_2$ ,  $\text{OH}^-$
- C) concd.  $\text{H}_2\text{SO}_4$ ; then  $\text{H}_2\text{O}$ , heat
- D)  $\text{Hg}(\text{OAc})_2/\text{THF}-\text{H}_2\text{O}$ ; then  $\text{NaBH}_4, \text{OH}^-$
- E)  $\text{HBr}$ ; then  $\text{NaOH}/\text{H}_2\text{O}$

Ans: D

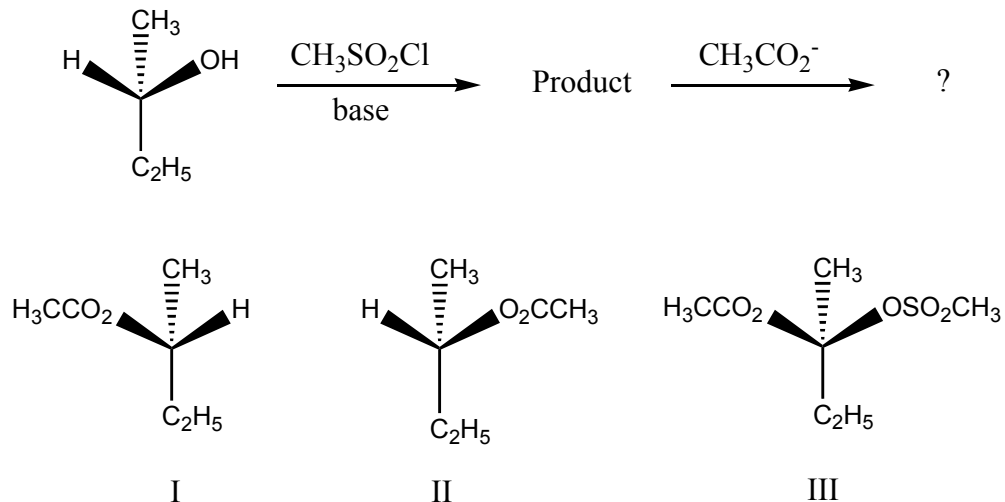
14. Which of the following could be used to synthesize 1-bromobutane efficiently?

- A)  $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 + \text{HBr} \longrightarrow$
- B)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} + \text{PBr}_3 \longrightarrow$
- C)  $\text{CH}_3\text{CH}_2\text{CH}_2(\text{OH})\text{CH}_3 + \text{HBr} \longrightarrow$
- D)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} + \text{Br}_2 \longrightarrow$
- E) None of these

Ans: B



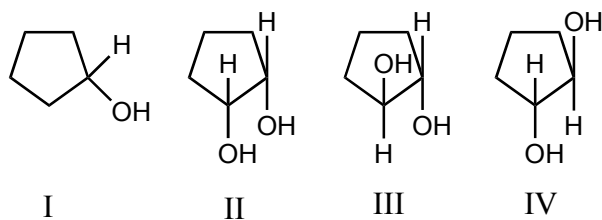
15. The major product of the following reaction would be:



- A) I  
 B) II  
 C) III  
 D) Equal amounts of I and II  
 E) None of these

Ans: A

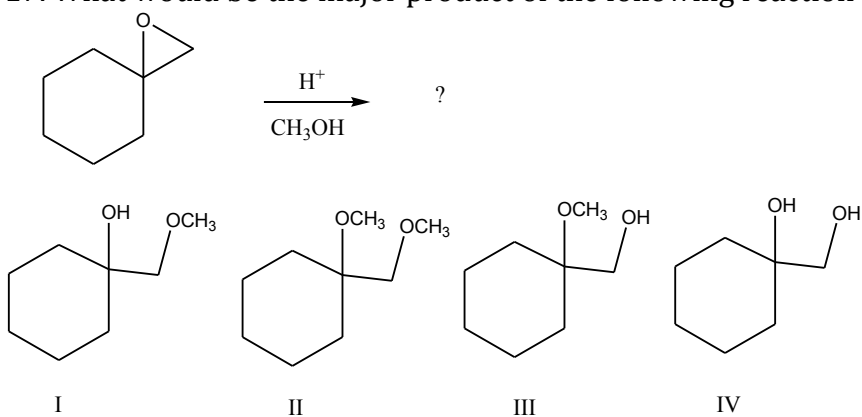
16. Epoxidation followed by reaction with aqueous base converts cyclopentene into which of these?



- A) I  
 B) II  
 C) III  
 D) IV  
 E) Equal amounts of III and IV

Ans: E

17. What would be the major product of the following reaction sequence?

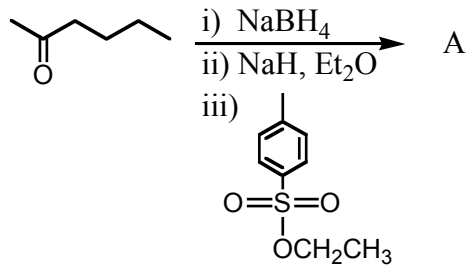


- A) I  
 B) II  
 C) III  
 D) IV  
 E) Equal amounts of II and IV  
 Ans C

18. What is the predominant product from the reaction of 2-hexanol with  $\text{Na}_2\text{Cr}_2\text{O}_7/\text{H}^+$ ?

- A)  $\text{CH}_3\text{CO}_2\text{H}$   
 B)  $\text{CH}_3(\text{CH}_2)_3\text{CO}_2\text{H}$   
 C)  $\text{CH}_3(\text{CH}_2)_3\text{C}(=\text{O})\text{CH}_3$   
 D)  $\text{CH}_3(\text{CH}_2)_4\text{CO}_2\text{H}$   
 E) A) and B)  
 Ans: C

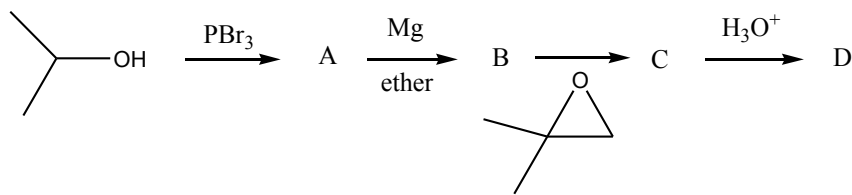
19. What would be the major product of the following reaction?



- A)  $\text{CH}_3\text{CH}_2\text{OCH}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- B)  $(\text{CH}_3\text{CH}_2\text{O})_2\text{CHCHOHCH}_2\text{CH}_2\text{CH}_3$
- C)  $(\text{CH}_3\text{CH}_2)_2\text{CHOHCH}_2\text{CH}_2\text{CHOHCH}_3$
- D)  $\text{CH}_3\text{OCH}(\text{C}_2\text{H}_5)\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- E)  $\text{CH}_3\text{CH}_2\text{CH}(\text{OCH}_3)\text{CH}_2\text{CH}_2\text{CHOHCH}_3$

Ans: A

20. The final product, D, in the following reaction sequence



would be:

- A)
- B)
- C)
- D)
- E)

Ans: C