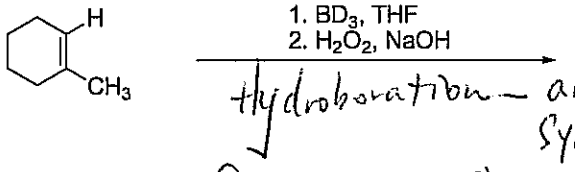
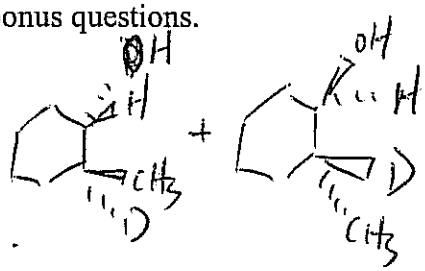
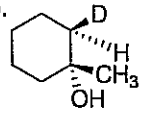
CH 222 Spring 2009
Exam 2
Print your name:_____
Mark your name and answers on the scantron sheet.
Part. I (80 pts) Four out of these twenty questions will be counted as bonus questions.

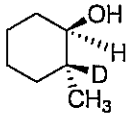
1. Predict the major product of this reaction sequence shown below.

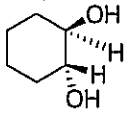


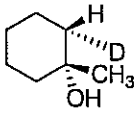
hydroboration — anti-Mark.
syn-stereochem.



a). 

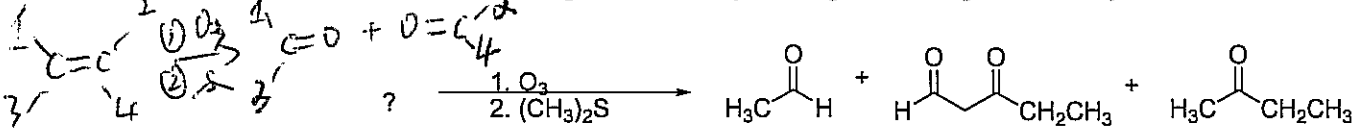
b). 

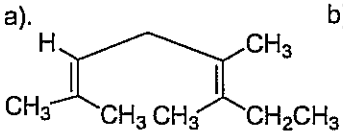
c). 

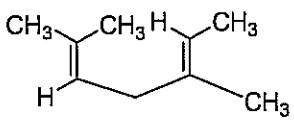
d). 

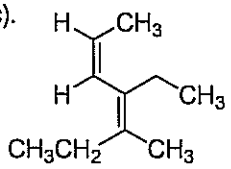
e). none of these answers

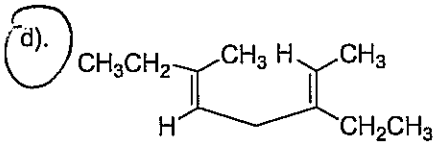
2. What is the structure that produces only these products upon ozonolysis?



a). 

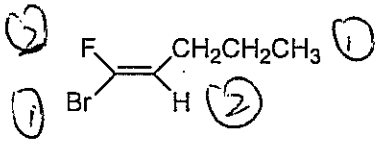
b). 

c). 

d). 

e). none of these answers

3. What is the IUPAC name for this compound?



(a) (*E*)-1-bromo-1-fluoropent-1-ene (b) (*Z*)-1-fluoro-1-bromopent-1-ene
(c) (*E*)-1-fluoro-1-bromopent-1-ene (d) (*Z*)-1-bromo-1-fluoropent-1-ene
(e) none of these answers

4. Which reagent(s) will effect this synthesis?

least substituted

anti-Mark

stereochemistry is not shown.

a). OsO_4, H_2O_2

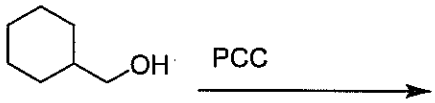
b). 1. BH_3•THF 2. H_2O_2, NaOH

c). H_2O

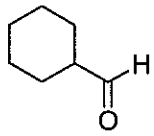
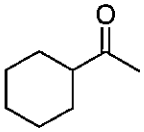
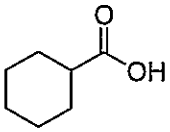
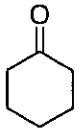
d). 1. $Hg(OAc)_2$, H_2O 2. $NaBH_4$

e). none of these answers

5. What is the expected product(s) for the reaction shown?

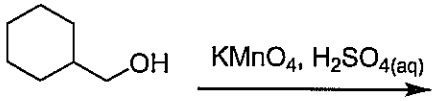


Will Not be on this exam.

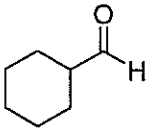
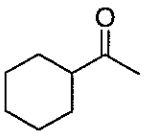
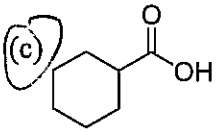
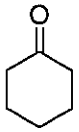
(a)  (b)  (c)  d) 

e) none of these answers

6. What is the expected product(s) for the reaction shown?

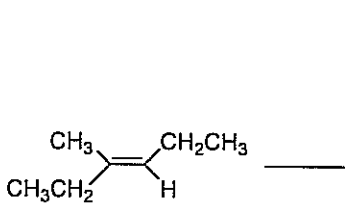


Will Not be on this exam.

(a)  (b)  (c)  d) 

e) none of these answers

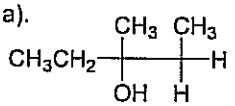
7. What is the expected product for the reaction shown?

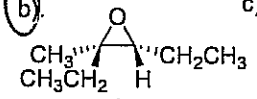


make epoxide (epoxidation). Retain stereochemistry

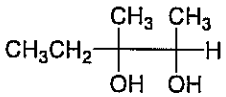
mCPBA (peroxy acid)

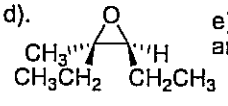
syn-addition

a). 

b). 

+ enantiomer.

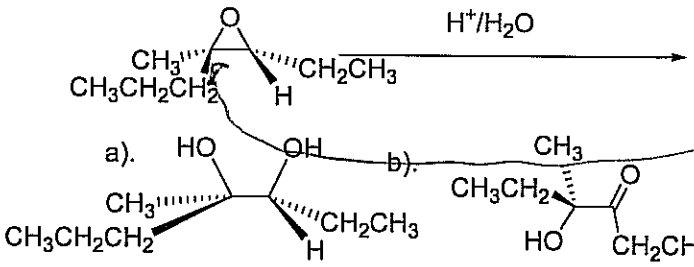
c). 

d). 

e). none of these answers

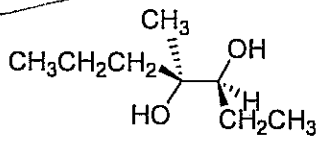
8. What is the expected product for the reaction shown?

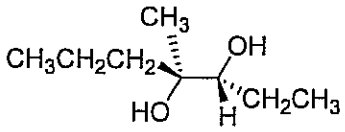
epoxide ring opening under acidic condition.
Nu = H2O attacks the most substituted ring carbon.



a).

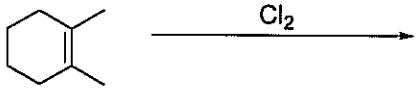
b).

c). 

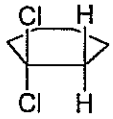
d). 

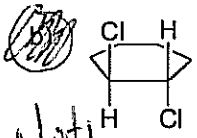
e). none of these answers

9. What is the expected product for the reaction shown?

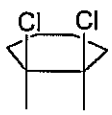


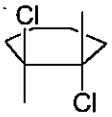
halogenation of Alkene Ch. 8. anti-addition.

a). 

b). 

Not.

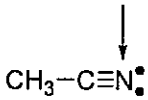
c). 

d). 

e). none of these answers

Answer ⇒ D.

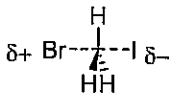
10. What is the formal charge at the indicated nitrogen atom?

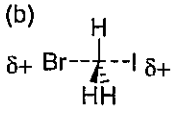


(a) 0 (b) +2 (c) +1 (d) -2 (e) -1

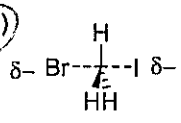
11. Which is the transition state for the following reaction?

CH6.

(a) 

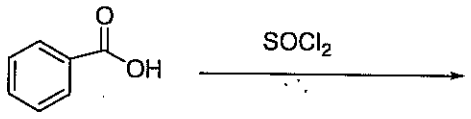
(b) 

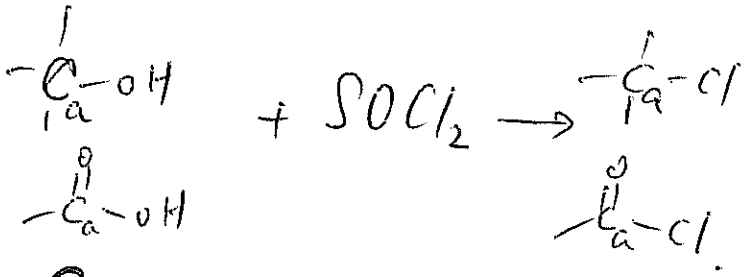
(c) 

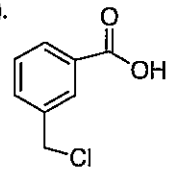
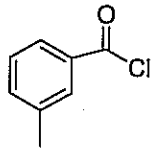
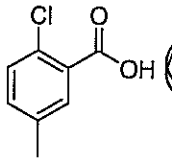
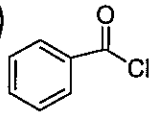
(d) 

(e) none of these answers

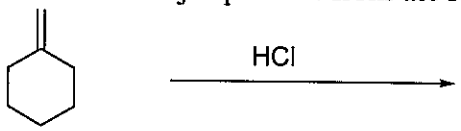
12. Predict the major product from the reaction shown.



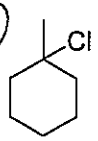
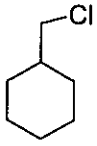
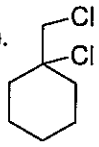
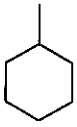


a).  b)  c).  d).  e). none of these answers

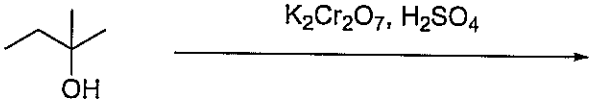
13. Predict the major product from the reaction shown.



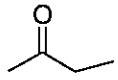
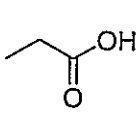
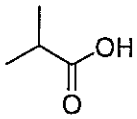
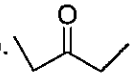
Made ch. 8

a).  b).  c).  d).  e). none of these answers

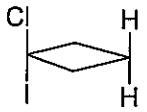
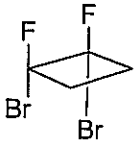
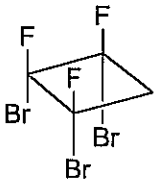
14. Predict the major product from the reaction shown.



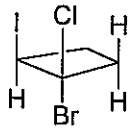
Will NOT be on this exam.

a).  b).  c).  d).  (e), none of these answers

15. Which of the following is optically active? = chiral ch. 5.

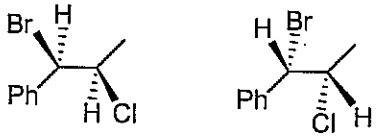
(a)  (b)  (c) 

that = internal mirror plane of symmetry.

(d)  (e) none of these answers

← No internal mirror plane of symmetry.

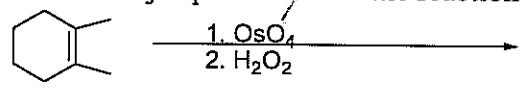
16. What is the relationship between these two structures?

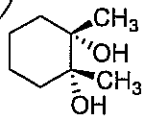
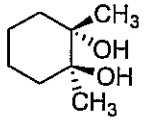
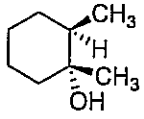
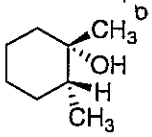


(a) constitutional (b) conformational (c) diastereomers (d) enantiomers (e) identical

vicinal diol (syn-addition)

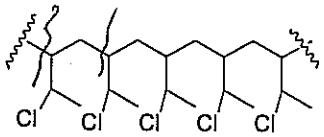
17. Predict the major product from the reaction shown.



a).  b).  c)  d)  e). none of these answers

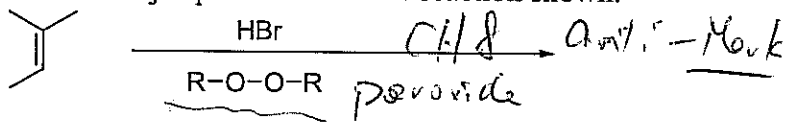
enantiomer.

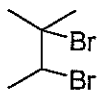
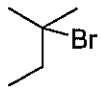
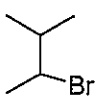
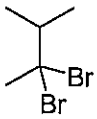
18. What is the monomer of the polymer?



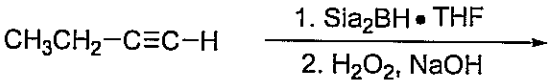
a). $(CH_3)_2C=C(CH_3)_2$ b) $CH_2=CHCHClCH_3$ c). $CH_3CH=CHCH_2Cl$ d). $CH_2=CHCH_3$ e). none of these answers

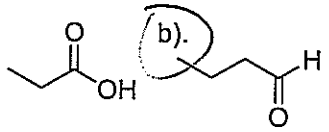
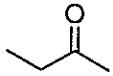
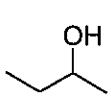
19. Predict the major product from the reaction shown.



a).  b).  c).  d).  e). none of these answers

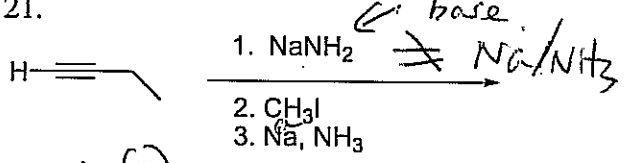
20. Predict the major product from the hydroboration reaction shown.

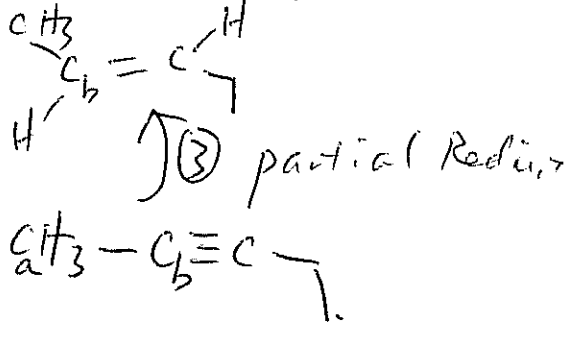


a).  c). none of these answers d).  e) 

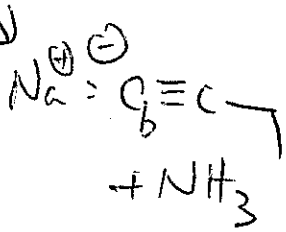
II. Predict the major organic product(s) with correct stereo- and region-chemistry if applicable of each of the following synthesis (15 pts)

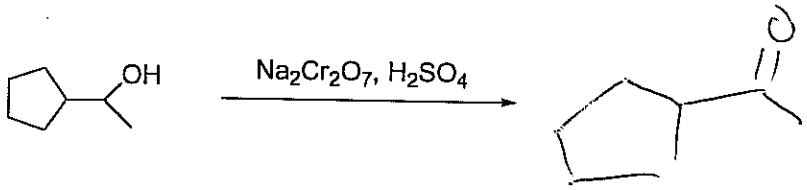
21.





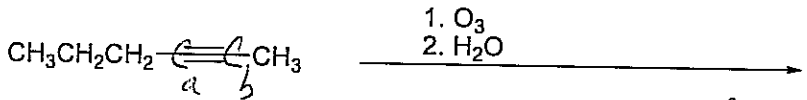
22.

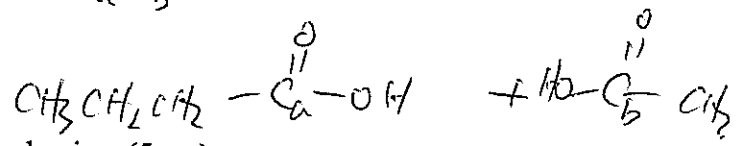




will Not be on this exam.

23.

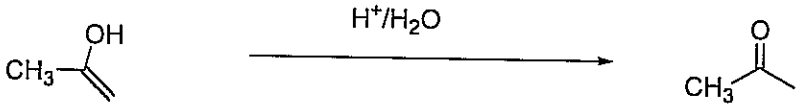




III. Mechanism (5 pts)

On your answer sheet, write a mechanism to explain the formation of the indicated product for each of the following reaction. Predict the product if needed. Show structures (with proper stereochemistry if applicable) for all reactive intermediates and indicate the direction of electron flow in all bond-forming and bond-breaking steps by means of curved arrows.

24.



Will Not be on the exam!!