THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE / STAND ALONE COURSES IN SCIENCE 2009 /2010
ORGANIC CHEMISTRY CHU 2221/CHE 4221

ASSIGNMENT TEST II

Date: 17th February 2010 Time: 4.00 – 5.30 p.m.

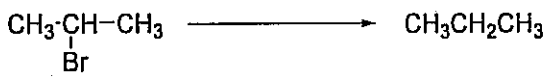
Answer all questions.

Part A

1. With what reagent CH_3MgBr does not give CH_4 as a product?

   (1) H_2O (2) $LiAlH_4$ (3) CH_3OH (4) NH_3 (5) CH_3COOH

2. Consider the conversion and the set of reagents given below.

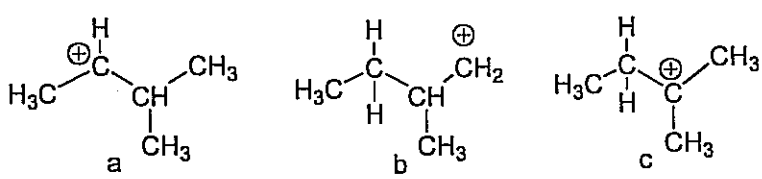


   a. $LiAlH_4$
   b. Zn/ CH_3COOH
   c. Zn/ NaOH

   The conversion given above can be accomplished by using,

   (1) a only (2) b only (3) c only (4) a and c only (5) a, b and c

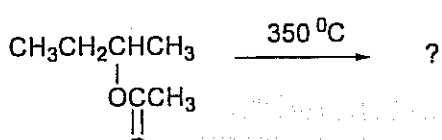
3. Consider the following three carbocations.

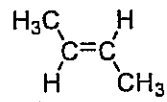
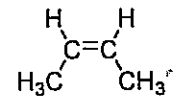


   Which of these carbocations can undergo rearrangement?

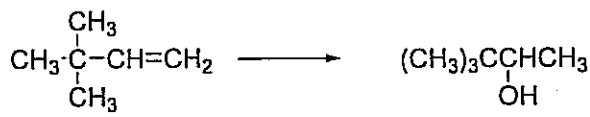
   (1) a only (2) b only (3) c only (4) a and b only (5) a and c only

4. What is the product which **cannot** be resultant by the following pyrolysis?



(1) CH_3COOH (2) $CH_3CH_2CH=CH_2$ (3) $CH_3C(CH_3)=CH_2$ (4)  (3) 

5. What is the best set of reagents to accomplish the following reaction?

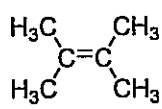
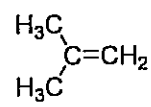
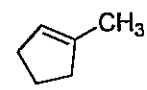


(1) 98% H_2SO_4 (2) $Hg(OAc)_2/H_2O$
(3) OsO_4/ether; $NaHSO_3$ (4) MnO_2/OH^-; H_2O (5) $(BH_3)_2/H_2O$; NaBH4

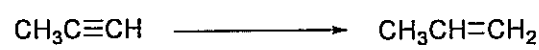
6. An alkene after addition of HOCl was treated with a strong base. What could be the final product?

(1) an alkane (2) a diol (3) an epoxide 4) a halohydrin (5) a monohydric alcohol

7. An alkene subjected to ozonolysis yielded two major compounds. What could the alkene be out of the following?

(1)  (2)  (3) $CH_2=CH_2$ (4)  (5) 

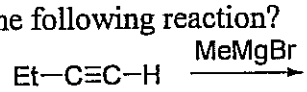
8. What are the possible reagents that can be used to carry out the following conversion?



a. $H_2/Pd/BaSO_4$/quinoline b. Na/liq.NH_3 c. BH_3/THF

(1) a only (2) b only (3) b and c (4) a and b 5) a, b and c

9. What is the major product of the following reaction?

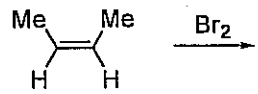


(1) Et—C≡C–Me (2) Et—C≡C–Mg-Me
(3) Et—C≡C–Br (4) Et—C≡C–OH (5) Et—C≡C–MgBr

10. What is the compound that gives a colored precipitate with Cu^+ in ammonia solution?

(1) $CH_3C{\equiv}CH$ (2) $CH_3CH=CH_2$
(3) $CH_3C{\equiv}CCH_3$ (4) $CH_3CH=CHCH_3$ (5) $CH_3C{\equiv}CCH=CH_2$

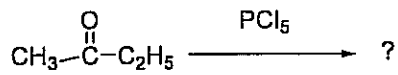
11. Consider the following reaction.

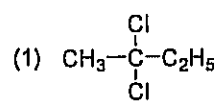
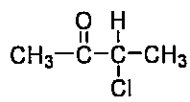
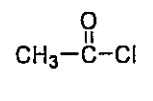
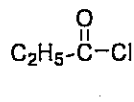
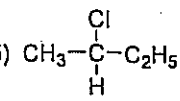


The product of this reaction is

(1) A racemic mixture of 2,3-dibromobutane
(2) *Meso*-2,3-dibromobutane
(3) All three stereoisomers of 2,3-dibromobutane
(4) One of the optically active 2,3-dibromo butane
(5) A diastereoisomeric mixture of 2,3-dibromobutane

12. What is the major product of the following reaction?



(1) 
(2) 
(3) 
(4) 
(5) 

13. Choose the **wrong** statement regarding E2 elimination.

(1) Carbocations are not formed during the reaction
(2) Rate of E2 reactions depends on the concentration of the substrate
(3) Rearrangements are possible with E2 elimination
(4) Eliminating groups must be trans to each other
(5) Alkyl halides undergo E2 elimination to give more substituted alkene as the major product

14. Consider the following statements regarding E1 mechanism.

a. The reaction proceeds via a carbocation
b. Reaction rate depends only on the concentration of the substrate
c. Stability of the transition state parallels the rate of the reaction

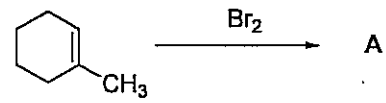
The **correct** statement(s) is/are

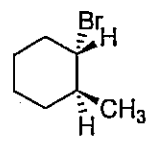
(1) a only (2) a and b (3) a and c (4) b and c (5) a, b and c

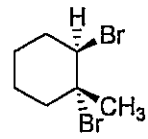
15. Which statement is **wrong** regarding nucleophilic substitution?

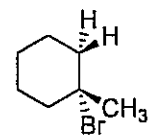
(1) S_N1 mechanism could lead to racemisation and rearrangement.
(2) S_N2 reactions takes place via complete inversion
(3) Strong nucleophilic reagents favour S_N2 mechanism
(4) Both S_N1 and S_N2 reaction rates depend on the concentration of the nucleophile
(5) There are no provisions for rearrangements in S_N2 mechanism

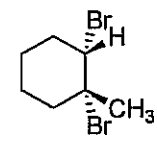
16. What is the structure of **A**?

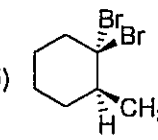


(1) 

(2) 

(3) 

(4) 

(5) 

17. How would you prepare the ether $(CH_3)_3C\text{-}O\text{-}CH_3$?

(1) Reaction between $(CH_3)_3C\text{-}Br$ and $CH_3O^-Na^+$
(2) Reaction between $(CH_3)_3CO^-Na^+$ and CH_3Br
(3) Reaction of $(CH_3)_3C\text{-}OH$ and CH_3OH with conc. H_2SO_4
(4) Using the methods given in (1) and (2)
(5) None of the methods given in (1), (2) and (3) above

18. Consider the following statements

a. *Para* nitro phenol is more water soluble than *ortho* nitro phenol
b. *Para* hydroxy benzaldehyde has a higher boiling point than *ortho* hydroxy benzaldehyde
c. Acetone is insoluble in water because it cannot form H-bonding

The **correct** statement(s) is(are)

(1) a (2) b (3) c (4) a and c (5) a and b

19. Consider the following statements regarding crown ethers

a. Crown ethers can be considered as cyclic polymers of ethylene glycol or derivatives of ethylene glycol
b. Crown ether- metal complexes are soluble in non polar organic solvents
c. 18-crown-6-ether has 18 carbon atoms in its ring

Which statement(s) is/are **true**?

(1) a only (2) a and b (3) a and c (4) b and c (5) a, b and c

20. What is the best set of reagents to carry out the following conversion?

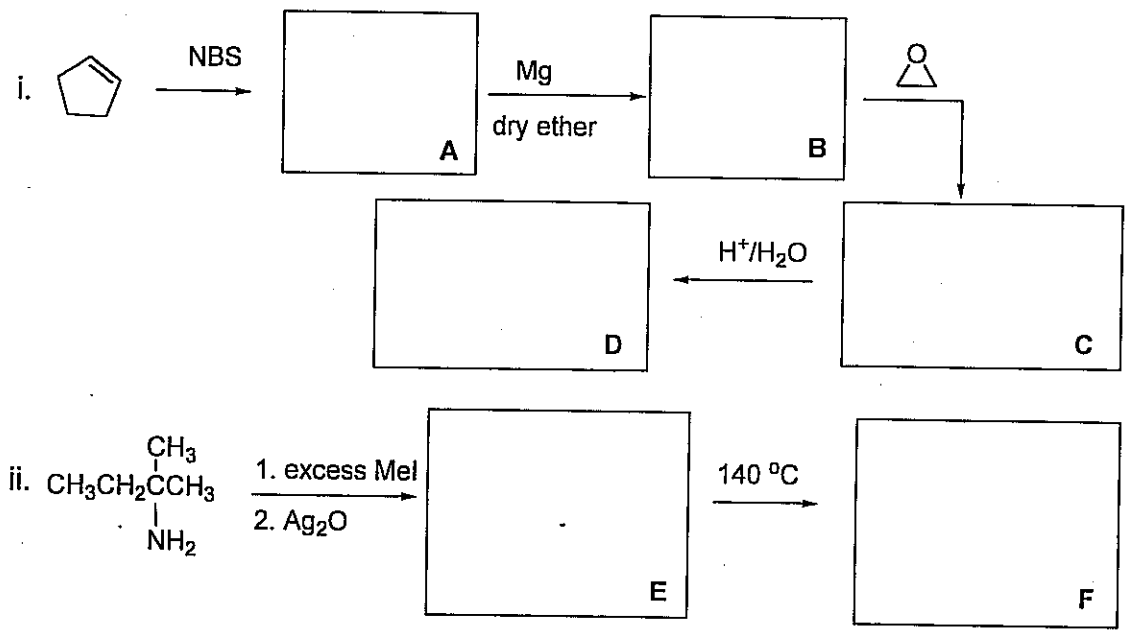
$$CH_3CH_2CH_2OH \longrightarrow CH_3CH_2CHO$$

(1) CrO_3/H_2SO_4
(2) $KMnO_4$
(3) $K_2Cr_2O_7$
(4) $Na_2Cr_2O_7$
(5) PCC/CH_2Cl_2, 25^0C

Reg. No:								

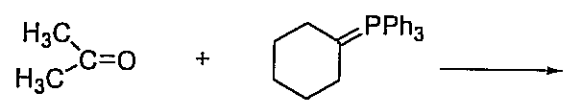
Part B

1. (a) Complete the following reaction schemes by giving the structures of compounds **A-F**.



(30 Marks)

(b) Consider the following reaction between acetone and the phosphorus ylide:



(i) Give the structure of the product of the above reaction.

(ii) Write the mechanism for the formation of this product.

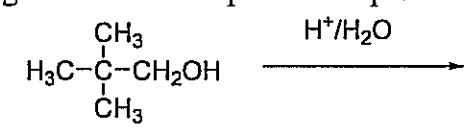
Reg. No:								

(iii) Giving necessary reagents and conditions, show how you can prepare the phosphorus ylide given above from bromocyclohexane.

(20 marks)

2. (a). Giving necessary reagents and conditions show how you would carry out the following conversion?

(b). Giving the mechanism predict the product of the following.



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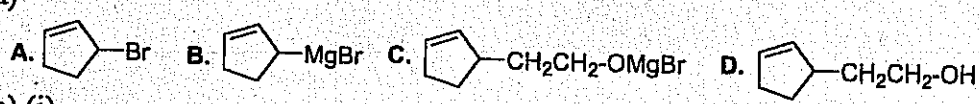
B.Sc Degree/Stand Alone Programme 2009/2010
Organic Chemistry
CHU 2221 Assignment test II
Answer guide

Part A – MCQ

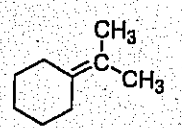
1. (2)	2. (5)	3. (4)	4. (3)	5. (1)	6. (3)	7. (4)	8. (4)	9. (1)	10. (1)
11. (1)	12. (1)	13. (3)	14. (5)	15. (4)	16. (4)	17. (3)	18. (5)	19. (2)	20. (5)

Part B

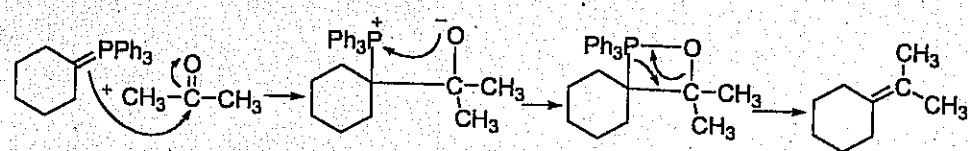
1. (a)



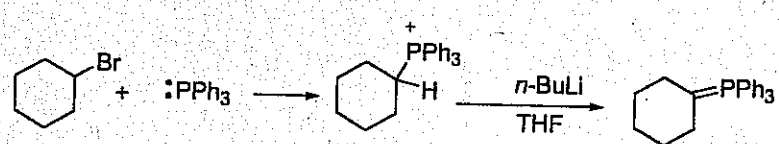
(b) (i)



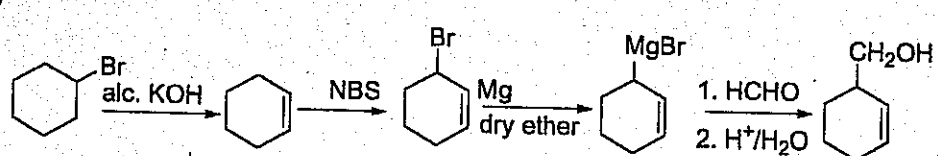
(ii)



(iii)



2. (a)



(b)