



THE OPEN UNIVERSITY OF SRI LANKA
B. Sc. Degree / Stand Alone Courses in Science 2006/2007
Organic Chemistry CHU 2221/CHE 4221
Assignment Test II
Duration: 1 ½ Hrs

DATE: 2007 – 01 – 20 (Saturday)

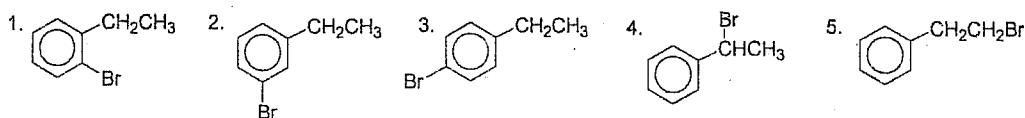
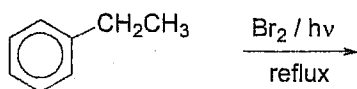
TIME: 11.30 a.m. – 1.00 p.m

Maximum marks allocated to this paper are 105. However a candidate who scores 100 marks or above will be awarded 100% and those scoring less will be awarded the score they make.

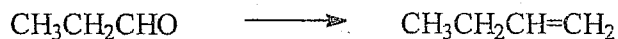
Answer all questions.

Part A

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

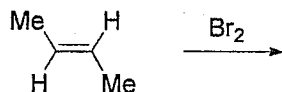


2. What is the best set of reagents to carry out the following reaction?



- (1) (i) MeMgBr (ii) $\text{H}^+/\text{H}_2\text{O}$ (iii) conc. $\text{H}_2\text{SO}_4/\Delta$
- (2) $\text{CH}_2=\text{PPh}_3$
- (3) (i) MeMgBr (ii) $\text{H}^+/\text{H}_2\text{O}$ (iii) alcoholic KOH / Δ
- (4) Both the reagent sets (1) and (2) are equally good
- (5) None of them yield the expected product

3. Consider the following reaction



The product of this reaction is

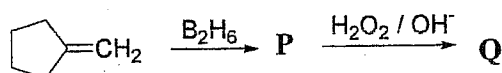
- (1) A racemic mixture of 2,3-dibromobutane
- (2) *Meso*-2,3-dibromobutane
- (3) All three stereoisomers of 2,3-dibromobutane
- (4) One of the optically active 2,3-dibromobutane
- (5) A diastereoisomeric mixture of 2,3-dibromobutane

4. What is the best set of reagents for the following conversion?



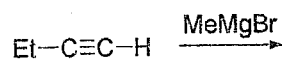
1. $\text{H}_2/\text{Ni}/140^\circ\text{C}$ 2. $\text{NaNH}_2/\text{Liq. NH}_3$ 3. $\text{H}_2/\text{Pd}/\text{BaSO}_4/\text{Quinoline}$
 4. (i) BH_3/THF ; (ii) $\text{CH}_3\text{CO}_2\text{H}$ 5. $\text{Na}/\text{Liq. NH}_3$

5. What are the products P and Q respectively, of the following reaction?



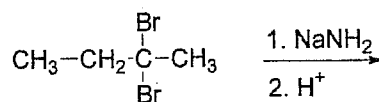
1. $\left[\text{Cyclopentane ring}-\text{CH}_2 \right]_3\text{B}$ and $\text{Cyclopentane ring}-\text{CH}_2\text{OH}$
 2. $\left[\text{Cyclopentane ring}-\text{CH}_2 \right]_3\text{B}$ and $\text{Cyclopentane ring}-\text{CH}_2\text{OH}$
 3. $\left[\text{Cyclopentane ring}-\text{CH}_2 \right]_3\text{B}$ and $\text{Cyclopentane ring}-\text{CH}_2\text{OH}$
 4. $\left[\text{Cyclopentane ring}-\text{CH}_2 \right]_3\text{B}$ and $\text{Cyclopentane ring}-\text{CH}_2\text{OH}$
 5. $\left[\text{Cyclopentane ring}-\text{CH}_2 \right]_3\text{B}$ and $\text{Cyclopentane ring}-\text{CH}_2\text{OH}$

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



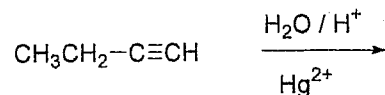
1. $\text{Et-C}\equiv\text{C-Me}$ 2. $\text{Et-C}\equiv\text{C-Mg-Me}$ 3. $\text{Et-C}\equiv\text{C-Br}$
 4. $\text{Et-C}\equiv\text{C-OH}$ 5. $\text{Et-C}\equiv\text{C-MgBr}$

7. What is the product of the following reaction?



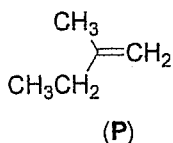
1. $\text{CH}_3\text{-CH}_2\text{-}\overset{\text{NH}_2}{\underset{\text{NH}_2}{\text{C}}}\text{-CH}_3$ 2. $\text{CH}_3\text{-CH}_2\text{-}\overset{\text{NH}_2}{\underset{\text{Br}}{\text{C}}}\text{-CH}_3$
 3. $\text{CH}_3\text{-CH}_2\text{-C}\equiv\text{CH}$ 4. $\text{CH}_3\text{-C}\equiv\text{C-CH}_3$ 5. $\text{CH}_3\text{-CH=C=CH}_2$

8. What is the most possible product of the following reaction?

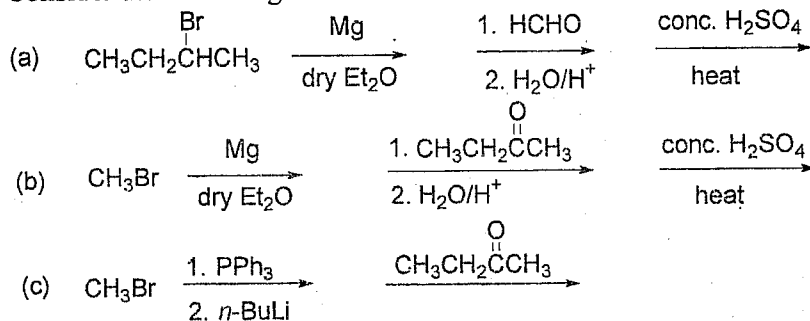


1. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$ 2. $\text{CH}_3\text{CH}_2\text{COCH}_3$ 3. $\text{CH}_3\text{CH}_2\text{CH}=\text{CHOH}$
 4. $\text{CH}_3\text{CH}_2\text{-}\underset{\text{OH}}{\text{C}}=\text{CH}_2$ 5. $\text{CH}_3\text{CH}_2\text{-}\underset{\text{OH}}{\overset{\text{OH}}{\text{C}}}\text{-CH}_3$

9. It is needed to prepare the alkene P in good yield.



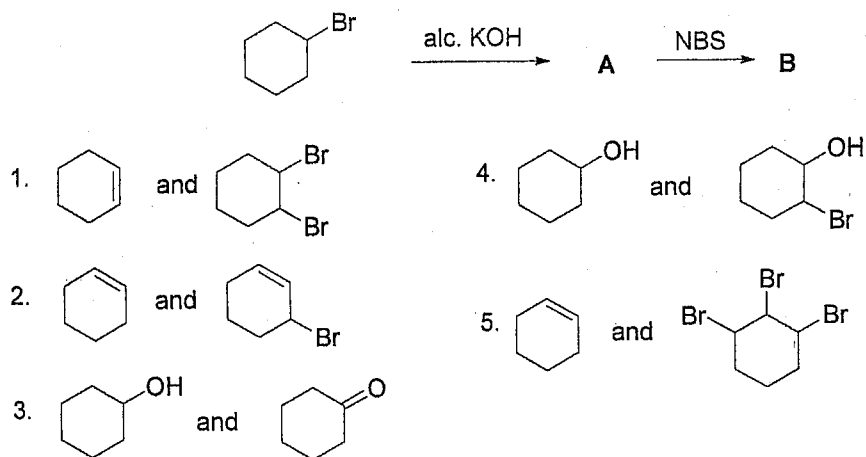
Consider the following methods:



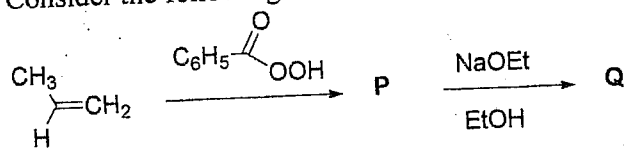
What is(are) the method(s) that could be employed for the above purpose?

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

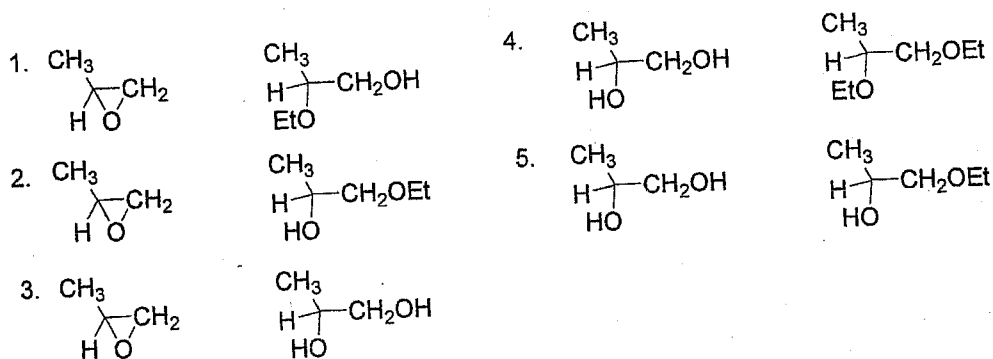
10. What are the product A and B of the following reaction sequence, respectively?



11. Consider the following reaction



The structures of the products P and Q respectively are



12. Consider the following statements regarding the S_N2 reactions?

- Primary alkyl halides undergo S_N2 reactions faster than tertiary alkyl halides
- S_N2 reactions occur in a single step
- Secondary alkyl halides undergo S_N2 reactions slower than tertiary alkyl halides

The correct statement(s) is(are): -

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

13. Consider the following statements regarding E2 reactions.

- E2 reactions are stereospecific
- Rate of E2 reactions depends only on the concentration of the substrate.
- Rearrangements are not possible with E2 reaction

The correct statement(s) is(are): -

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

14. Which of the following statements is true regarding nucleophilic substitution reactions?

- S_N1 reactions occur with racemisation.
- Weak nucleophiles favour the S_N2 mechanism.
- Non polar solvents favour the S_N1 mechanism
- S_N2 reactions occur with racemisation.
- Rates of S_N2 reactions are largely affected by electronic effects.

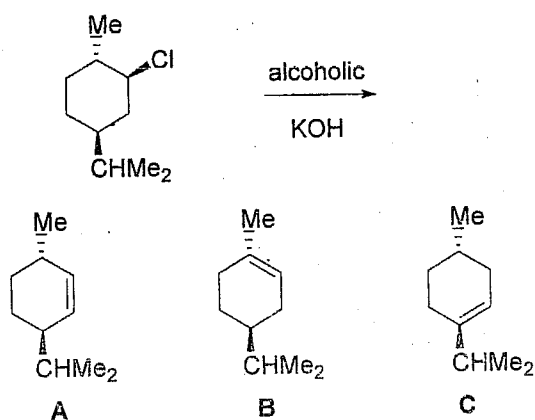
15. Consider the following statements regarding E1 reactions

- (a) Rate of E1 reactions depends only on the concentration of the substrate.
 (b) Rate of E1 reactions depends on the concentration of the substrate and the base.
 (c) Rearrangements are not possible with E1 reaction

The correct statements are: -

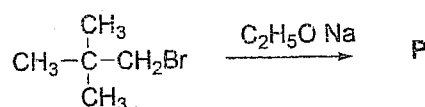
- (1) (a) and (c) (2) (b) and (c) (3) (a) (4) (b) (5) (c)

16. What is/are the product/s of the following reaction?



1. A 2. B 3. A and B 4. A and C 5. B and C

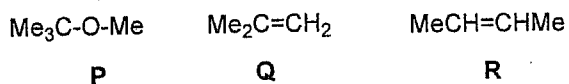
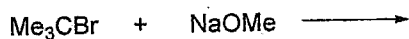
17. Consider the following reaction.



What is the structure of P?

1. $\text{CH}_3-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}-\text{CH}_2\text{OC}_2\text{H}_5$ 2. $\text{CH}_3-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}-\text{CH}_2\text{OH}$ 3. $\text{CH}_3-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-\text{CH}_2\text{CH}_3$
4. $\text{CH}_3-\overset{\text{CH}_3}{\underset{\text{OC}_2\text{H}_5}{\text{C}}}-\text{CH}_2\text{CH}_3$ 5. $\text{CH}_3-\overset{\text{CH}_3}{\underset{\text{C}_2\text{H}_5}{\text{C}}}-\text{CH}_2\text{CH}_3$

18. What is/are the product/s of the following reaction?



1. P 2. Q 3. R 4. P and R 5. Q and R

19. Consider the following statements regarding ethers.

- (a) Ethers can form H bonds with water.
 (b) Ethers could not be cleaved by conc. HBr
 (c) Ethers do not react with strong aqueous NaOH.

The correct statement(s) is(are):

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

20. Consider the following statements.

- (a) *Para* nitro phenol is more water soluble than *ortho* nitro phenol
 (b) Acetone has a higher boiling point than butane
 (c) Acetone is soluble in water but it cannot form H-bonding with water

The correct statement(s) is(are):

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