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30 APR 2011

Name: .....

THE OPEN UNIVERSITY OF SRI LANKA  
KANDY REGIONAL CENTRE  
EXAMINATION

**THE OPEN UNIVERSITY OF SRI LANKA**  
**B. Sc Degree Programme and**  
**Stand Alone Courses in Science - 2010/2011**  
**CMU2221/CME4221 - Organic Chemistry I**  
**ASSIGNMENT TEST III**

Ques No	Max	Marks
01	50	
02	50	
<b>Total</b>	<b>100</b>	

Date: Saturday, 30<sup>th</sup> April 2011

Time: 4.00 – 5.30 p. m.

**Answer ALL questions**

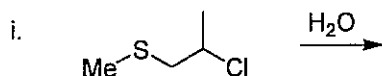
1. (a) Complete the following Table by stating the type of mechanism ( $S_N1$ ,  $S_N2$ , etc.) and giving the major product/products in the appropriate spaces when each of the given compounds are reacted with the reagents specified.

Compound	Reagent/ Solvent	Mechanism	Products/ Major product
$\begin{array}{c} \text{Cl} \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$	$\text{H}_2\text{O}/\text{MeOH}$		
$\begin{array}{c} \text{Br} \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$	$\text{CH}_3\text{S}^- \text{Na}^+$ in DMSO		
$(\text{CH}_3)_3\text{C}-\text{Br}$	NaOMe in MeOH		

(20 marks)

- (b) Giving the mechanisms predict the products of the following reactions.

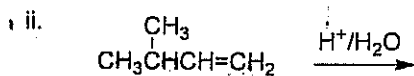
(20 marks)



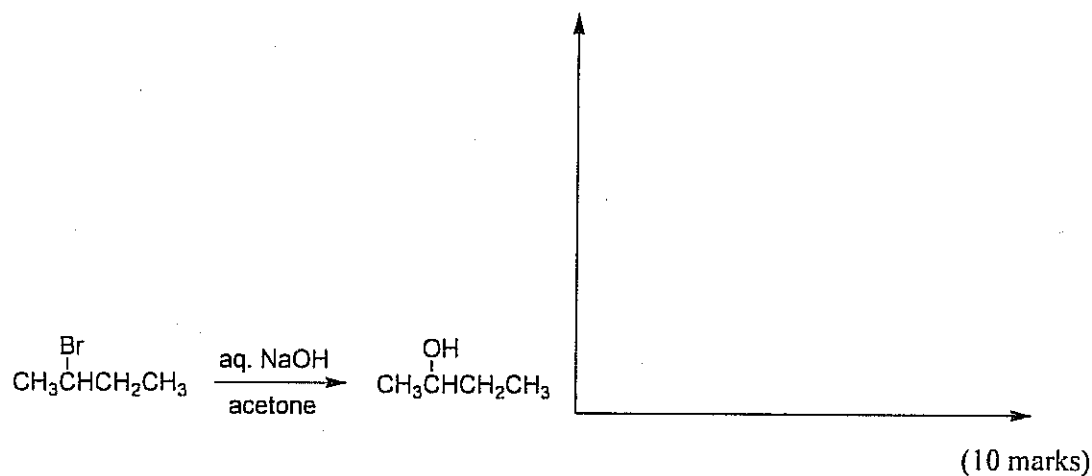
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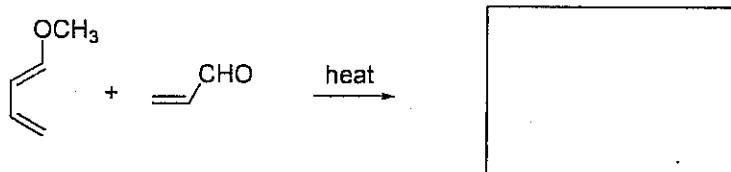
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(c) Draw the labeled energy for the following reaction.



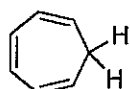
2. (a) What is the product of the following reaction?



(05 marks)

(b) Draw the Frost – Musulin diagram and the molecular orbital picture of cycloheptatrienyl cation and determine whether it is aromatic or not.

(05 marks)



cycloheptatriene

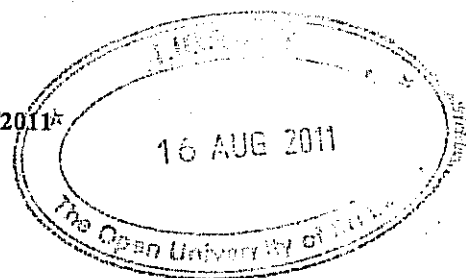


THE OPEN UNIVERSITY OF SRI LANKA

B.Sc Degree Programme and Stand Alone Courses in Science - 2010/2011\*

CMU2221/CME4221 - Organic Chemistry I

ASSIGNMENT TEST III – Answer guide



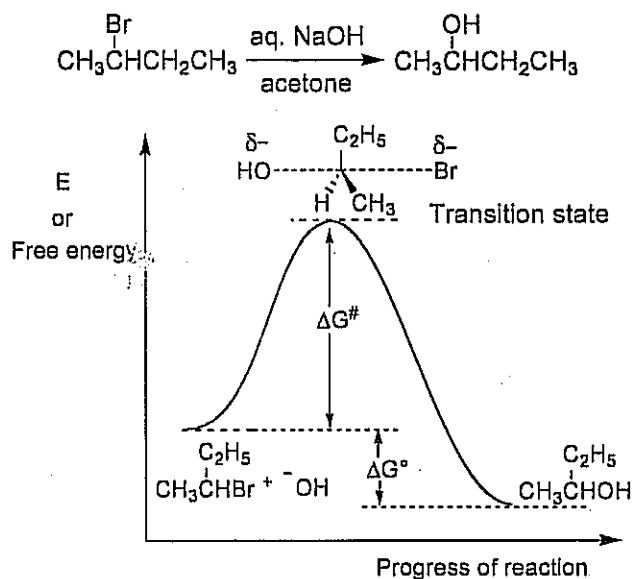
1. (a)

Compound	Reagent/ Solvent	Mechanism	Products/ Major product
$\begin{array}{c} \text{Cl} \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$	H <sub>2</sub> O/MeOH	S <sub>N</sub> 1	$\begin{array}{c} \text{OMe} \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array} + \begin{array}{c} \text{OH} \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$
$\begin{array}{c} \text{Br} \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$	CH <sub>3</sub> S <sup>-</sup> Na <sup>+</sup> in DMSO	S <sub>N</sub> 2	$\begin{array}{c} \text{SCH}_3 \\   \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$
(CH <sub>3</sub> ) <sub>3</sub> C-Br	NaOMe in MeOH	E2	$\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{C}=\text{CH}_2 \\ \diagup \\ \text{H}_3\text{C} \end{array}$

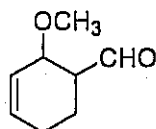
(b) i. Refer CMU2221 Unit II page 50

ii. Refer CMU2221 Unit II page 84

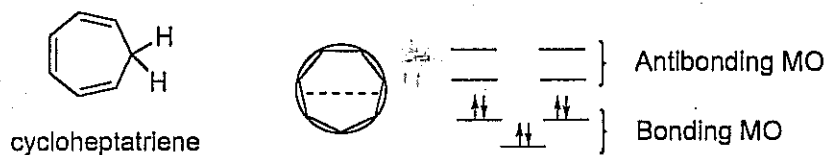
(c)



2. (a) Refer CMU2221 Unit V page 17

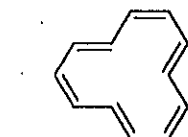


(b)

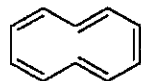


6  $\pi$  electrons are distributed in bonding orbitals. Hence cycloheptatrienyl cation is aromatic

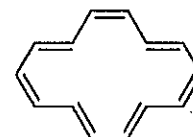
(c)



12  $\pi$  electrons  
Does not obey Hückel rule  
Not aromatic  
4n  $\pi$  electrons  
Anti aromatic

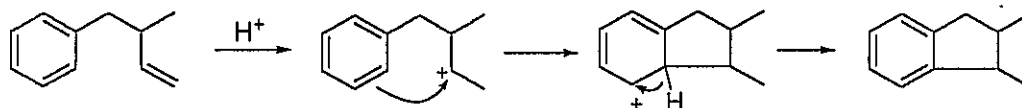


10  $\pi$  electrons  
4n + 2  $\pi$  electrons  
but not planar  
Hence not aromatic



14  $\pi$  electrons  
4n + 2  $\pi$  electrons  
planar  
Aromatic

(d) Refer CMU2221 Unit V page 159 Answer 4.1



(e) Primary carbocations are not stable. Hence the complex formed from propyl chloride and  $\text{AlCl}_3$  will undergo rearrangement to form 2° carbocation which is stable. The major product is formed from this more stable 2° carbocation.

