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THE OPEN UNIVERSITY OF SRI LANKA
B.Sc Degree Programme and
Stand Alone Courses in Science - 2011/2012
CMU2221/CME5221 - Organic Chemistry 1
CONTINUOUS ASSESSMENT TEST 1

Ques No.	Max.	Marks
1	18	
2	23	
3	35	
4	24	
Total	100	

Date: Saturday, 24th September 2011

Time: 9.00 – 10.30 a. m.

1. Select the term out of the following list (a – e) that best describes the pairs of compounds given below.

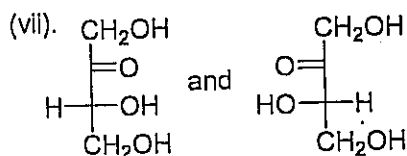
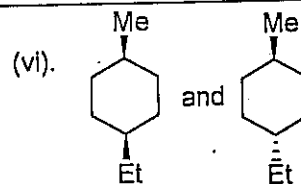
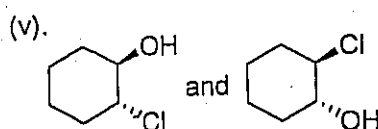
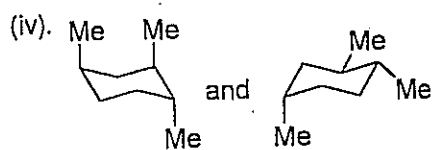
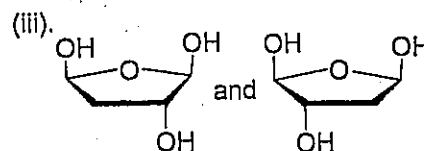
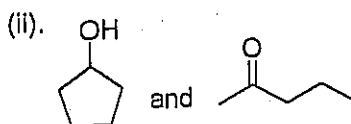
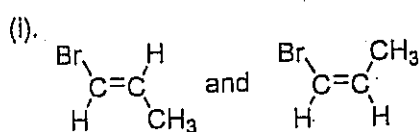
(a) constitutional isomers

(d) enantiomers

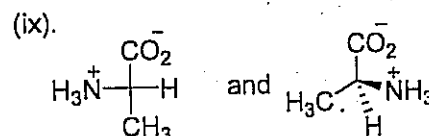
(b) diastereomers

(e) none of the above

(c) the same

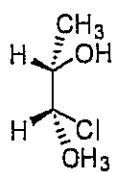


(viii). cyclopentane and pentane



(18 Marks)

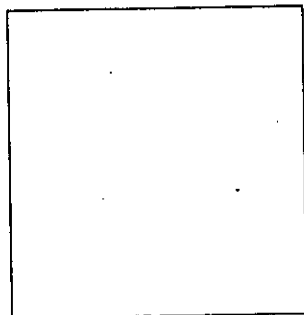
2. I) Consider the following compound **P**.



(P)

(i) Give the IUPAC name of **P**.

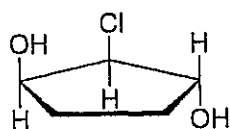
(ii) Draw the Fischer projection formula and circle the stereocentres in it.



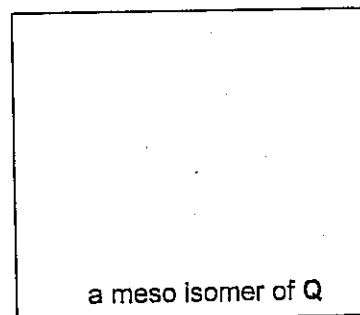
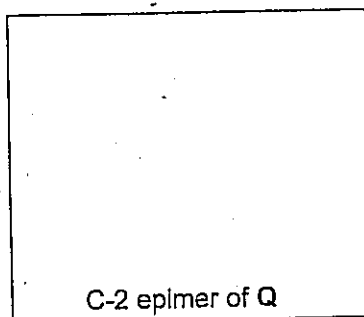
(iii) Assign the R/S configurations of the stereocentres.

(iv) Predict the number of stereoisomers possible for **P**.

II) Draw the relevant stereoisomers of **Q** in the cages.

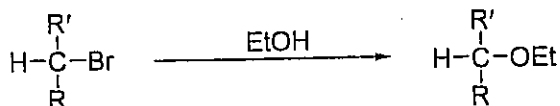


(Q)



(23 Marks)

3. The solvolysis of a secondary alkyl halide is given below.



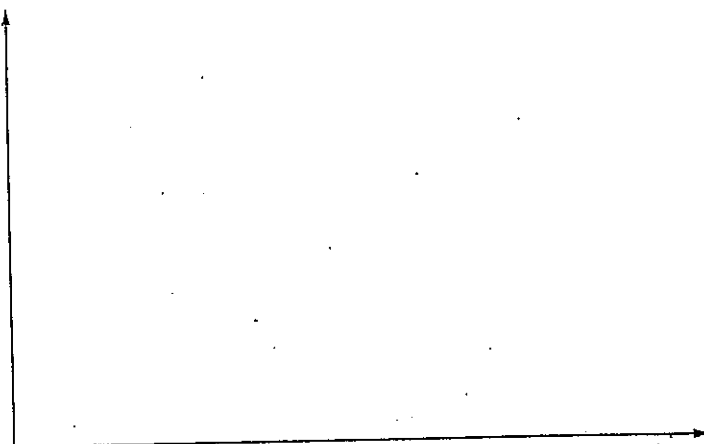
$\text{R}' = \text{C}_6\text{H}_{13}$

$\text{R} = \text{CH}_3$

(i) Write the mechanism for this reaction.

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(ii) Draw a completely labeled energy diagram for the course of the reaction.



(iii) Suppose the reaction medium is changed from EtOH to H₂O.

a) What changes do you expect when the reaction medium is H₂O.

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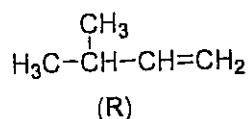
b) Give the reason for the above change briefly.

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.....

(35 marks)

4. The reaction between compound **R** and HCl, results in a two product mixture.



(i) Giving the mechanism propose the structures of the two products.

(ii) Label the major product of the reaction as **X**.

(iii) Give the reason for **X** to be the major product.

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(24 Marks)

CMU2221 Organic Chemistry I

Continuous Assessment Test I

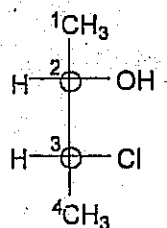
2011/2012

Answer Guide

- 1.
- (i) diastereomers (b)
 - (ii) constitutional isomers (a)
 - (iii) enantiomers (d)
 - (iv) diastereomers (b)
 - (v) same (c)
 - (vi) diastereomers (b)
 - (vii) enantiomers (d)
 - (viii) none of the above (e)
 - (ix) same (c)

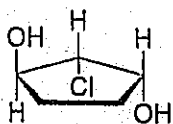
2. (I)

- (i) 3-chloro-2-butanol
- (ii)

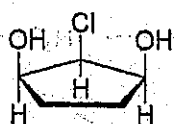


- (iii) 2 (S), 3 (R)
- (iv) $2^2 = 4$

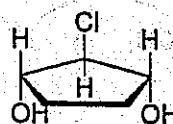
(II)



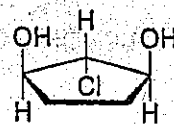
C-2 epimer of Q



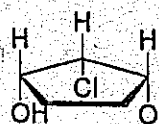
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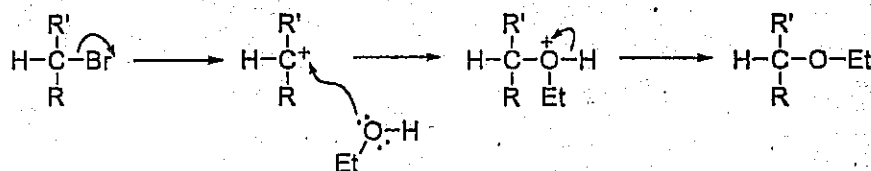
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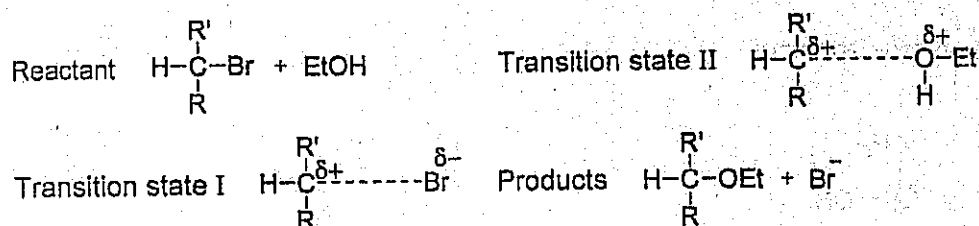
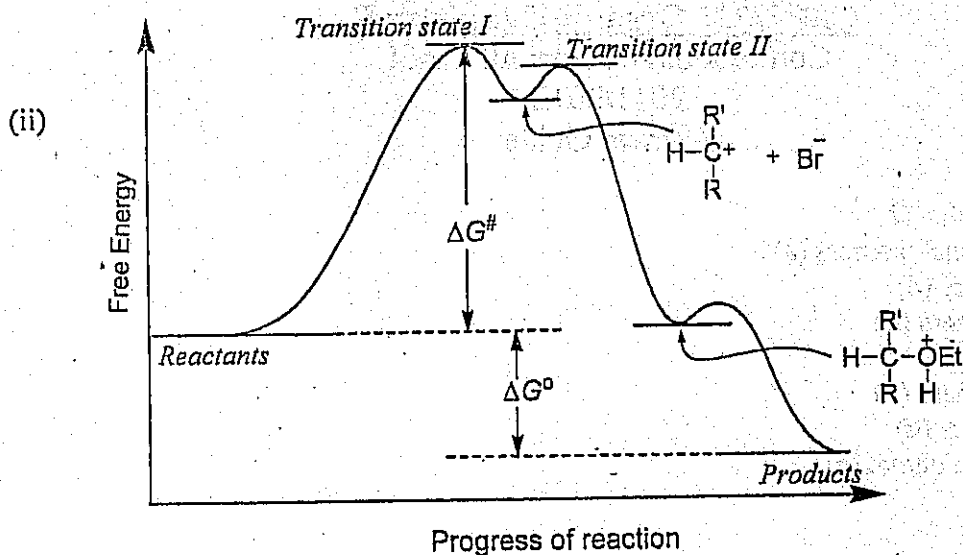


a meso isomer of Q

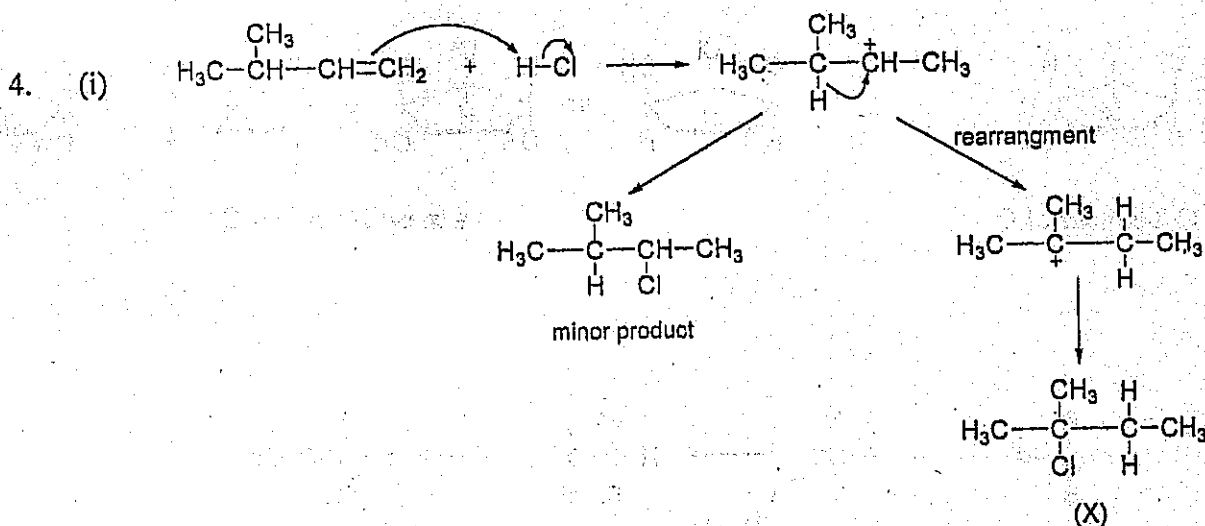
3.

(i)





- (iii) a. Reaction rate increases
 b. H_2O is polar than EtOH. Carbocation is more solvated & more stabilized. Therefore energy required for ionization is less. So reaction is faster.



- (iii) 3° carbocation is more stable than 2° carbocation. Therefore H migration takes place to give a 3° carbocation.