



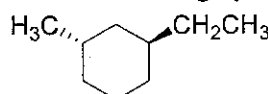
THE OPEN UNIVERSITY OF SRI LANKA
B. Sc. DEGREE PROGRAMME / STAND ALONE COURSE 2017 / 2018
LEVEL 4 - FINAL EXAMINATION
CYU4303 / CYE4303 - ORGANIC CHEMISTRY I
DURATION: 02 HOURS

Saturday 6th April 2019

9.30 a.m. - 11.30 p.m.

ANSWER ALL QUESTIONS

1. (a) (i) Draw chair conformations of the following cyclohexane derivative.

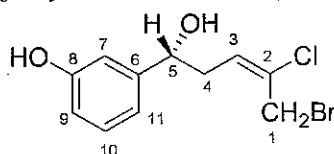


- (ii) Giving reasons state which chair conformation is more stable.

(20 Marks)

- (b) Consider the compound (A) given below.

(Carbon atoms are numbered for your convenience).



A

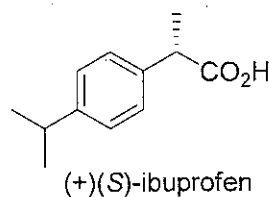
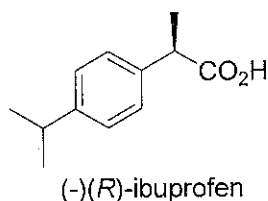
- (i) Determine the configurations of chiral centers as *R* or *S* and double bonds as *E* or *Z* showing the priorities of the groups attached to them according to Cahn-Ingold-Prelog rules.

Note: *If priorities of the groups are not clearly shown marks will not be awarded*

- (ii) How many stereoisomers are possible for A?
 (iii) Draw the remaining stereoisomers of A and label them as B, C, D, etc.
 (iv) State the stereochemical relationship of each of them with A.

(55 Marks)

- (c) How would you attempt to separate a racemic mixture of ibuprofen into optically pure (+) and (−) ibuprofen?



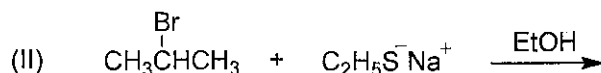
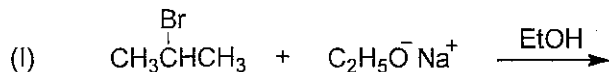
(25 Marks)

2. (a) Explain the following observations.

2-Chloro-2-methyl propane undergoes hydrolysis in water while 1-chlorobutane does not undergo hydrolysis under the same conditions. With the addition of NaOH into the reaction medium, 1-chlorobutane undergoes hydrolysis and the rate of hydrolysis is found to be dependent on the concentration of NaOH.

(35 Marks)

(b) Each of the following reaction can give rise to two products.

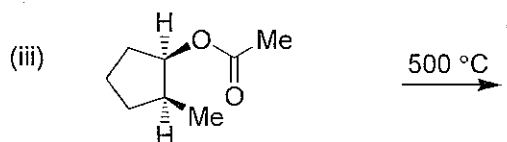
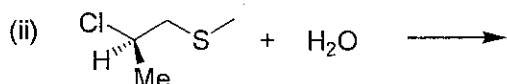
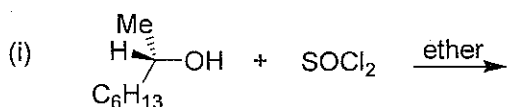


(i) Give the structures of the products arising from each of the two reactions.

(ii) Giving reasons, state which product is the major product in each reaction.

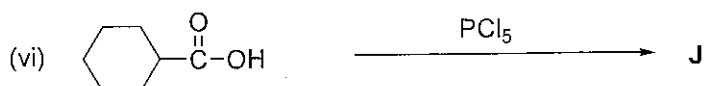
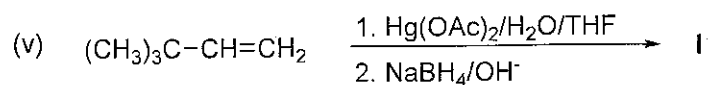
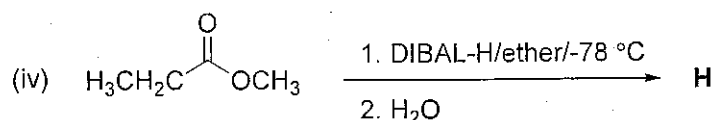
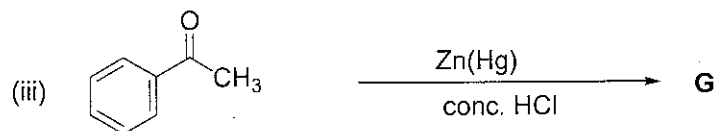
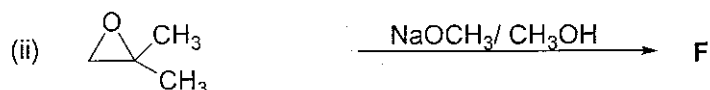
(35 Marks)

(c) Giving the mechanism predict the product of any **TWO (02)** of the following reactions.



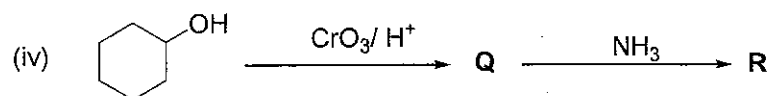
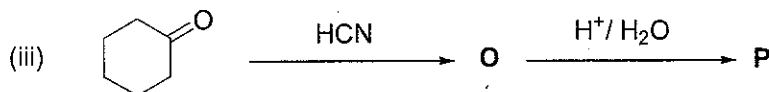
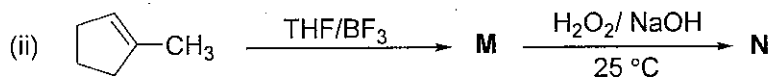
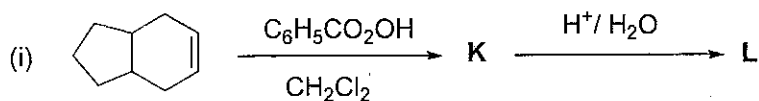
(30 Marks)

3. (a) Give the structures of the major products (E–J) of the following reactions.



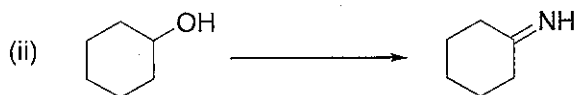
(30 Marks)

(b) Give the structures of the intermediates and the major products (**K–R**) in any **TWO (02)** of the following reaction schemes.



(40 marks)

(c) Giving necessary reagents and conditions show how any **ONE (01)** of the following transformations can be carried out.

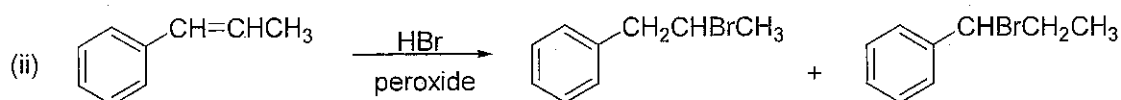
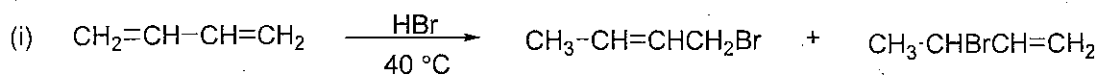


(30 Marks)

4. (a) Answer only **ONE (01)** part, either part (i) or part (ii).

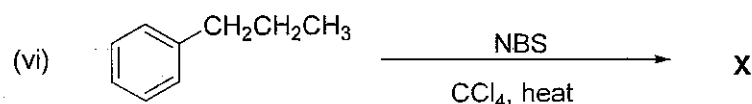
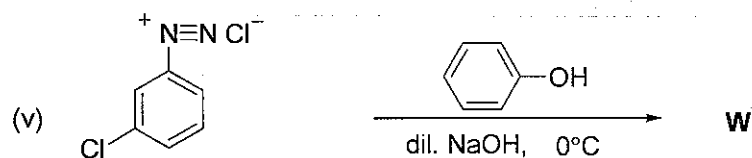
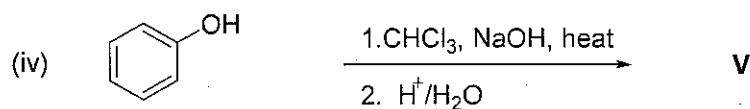
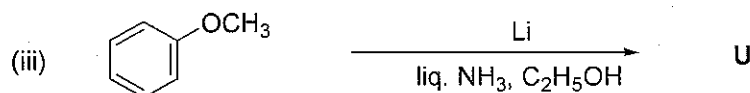
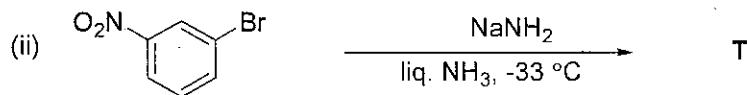
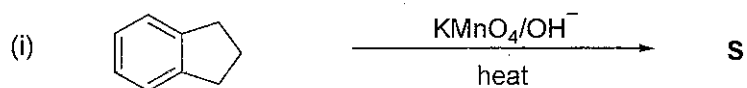
In the reactions given below, out of the two products shown only one is formed.

Giving reasons show which product is formed



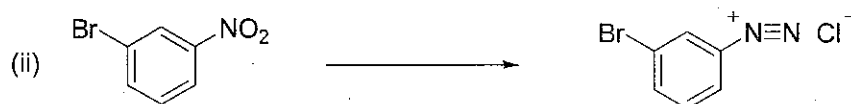
(35 Marks)

(b) Give the structures of the major products (S–Y) in the following reactions.



(35 Marks)

(c) Giving necessary reagents and conditions show how any **ONE (01)** of the transformations can be carried out.



(30 Marks)

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