Exam. Code : 210402
Subject Code : 4247

M.Sc. Chemistry 2nd Semester

ORGANIC REACTION MECHANISM—II

Course—IX

Time Allowed—3 Hours] [Maximum Marks—50

Note :— Attempt ***five*** questions in all, ***one*** question from each section and **fifth** question may be attempted from any section.

SECTION—A

1. (a) What do you mean by pyrolytic eliminations ? Give one example.

   (b) Discuss with examples effects of medium, leaving group and attacking base in E1cB mechanism.

   (c) Discuss hydroxylation of benzene by Fenton's reagent. 3,5,2

2. (a) Bromination of optically active 1-bromo-2-methylbutane furnishes 1,2-dibromo-2-methylbutane. Why ? Discuss along with the mechanism.

   (b) What is the synthetic utility of Hunsdiecker reaction ? Explain the mechanism by taking two examples.

   (c) Discuss with examples reactivity in the attacking radicals. 2.5, 5, 2.5

SECTION—B

3. (a) How addition to carbon-hetero multiple bonds is different from carbon-carbon multiple bonds ?

   (b) Discuss the mechanism of hydrogenation of aromatic rings by taking two examples.

   (c) Discuss sharpless asymmetric epoxidation with special emphasis on its regio and chemoselectivity. 2,4,4

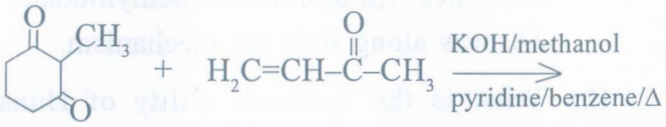
4. (a) How will you convert nitrile derivative to secondary amine ? What are the handling precautions of the reaction ?

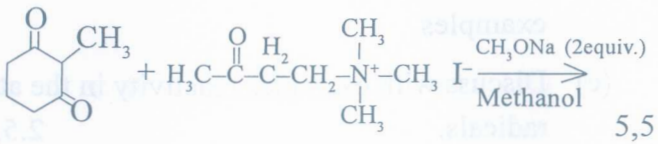
   (b) Discuss at least three synthetic applications of hydroboration reaction.

   (c) What is the role of DIBAL in organic synthesis ? 3,5,2

SECTION—C

5. Complete the following equations, showing first the product of Michael addition and then the intramolecular aldol condensation product. Give mechanism of Michael addition in first reaction (a) and mechanism of aldol condensation in second (b).

(a) 

(b) 

5,5

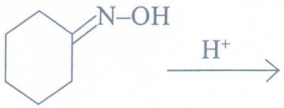
6. (a) Identify the product and write the mechanism of the following reaction :

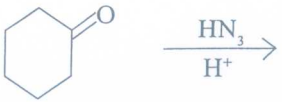
(b) Discuss Stobbe condensation with its mechanism. 5,5

SECTION—D

7. (a) What will be happen if a ketone, zinc and HCl are present in a round bottom flask ? Name and explain the mechanism of this reaction.

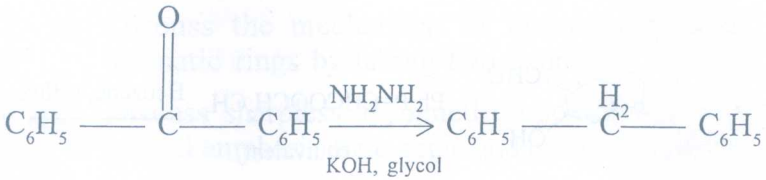
(b) Complete and outline the mechanism of the following reactions :

(i) 

(ii) 

4,6

8. (a) Write a detailed mechanism for the following reaction, including all reaction intermediates :



(b) By taking two example discuss the role of thallium(III) nitrate in oxidation. 5,5