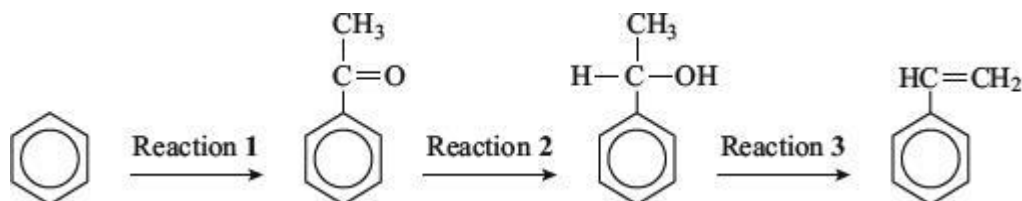


Max. Marks :28 Marks

Time :28 Minutes

A possible synthesis of phenylethene (*styrene*) is outlined below.



Name and outline the mechanism by which this reactive species reacts with benzene.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

- (b) NaBH_4 is a possible reagent for Reaction 2.
Name and outline the mechanism for the reaction with NaBH_4 in Reaction 2.
Name the product of Reaction 2.

(6)

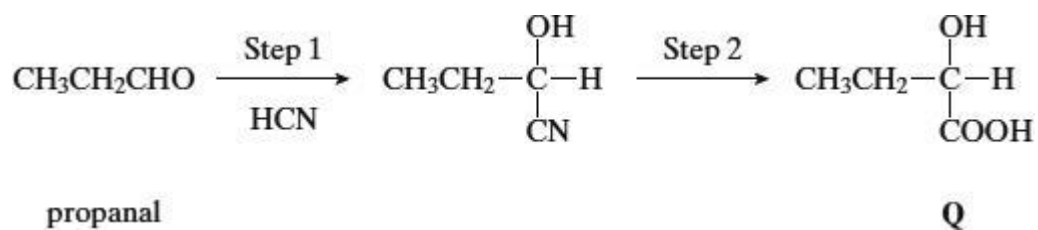
- (c) Name the type of reaction involved in Reaction **3** and give a reagent for the reaction.

(2)

(Total 14 marks)

Q2.

Consider the reaction sequence shown below.



- (a) Name and outline a mechanism for the reaction in Step 1.

Name of mechanism _____

Mechanism

(5)

- (b) (i) Name compound **Q** formed in Step 2.

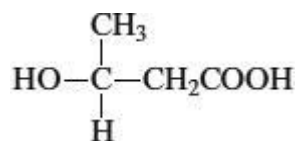
- (ii) Two stereoisomers are formed by the dehydration of **Q**. Give the structures of these two isomers and name the type of stereoisomerism shown.

Structures of isomers

Type of stereoisomerism _____

(4)

- (c) An isomer of **Q** which has the structure shown below is polymerised to form the biodegradable polymer known as PHB.

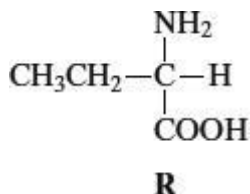


- (i) Draw the repeating unit of the polymer PHB.

- (ii) Suggest a reason why the polymer is biodegradable.

(2)

- (d) The amino acid **R** is shown below.



- (i) Draw the structure of the zwitterion formed by **R**.

- (ii) Draw the structure of the major organic product formed when an excess of **R** is reacted with bromomethane.

- (iii) Name the mechanism of the reaction which results in the formation of the product given in part (ii).

(3)

(Total 14 marks)