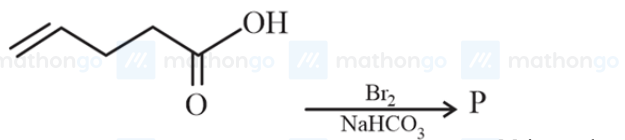
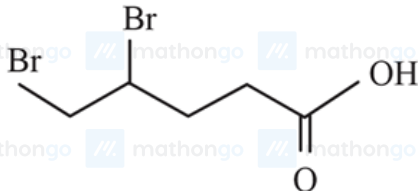


1. Major product 'P' formed in the following reaction is

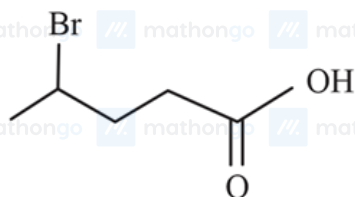


[2023 (08 Apr Shift 2)]

(1)



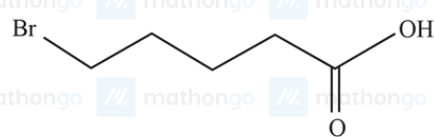
(2)



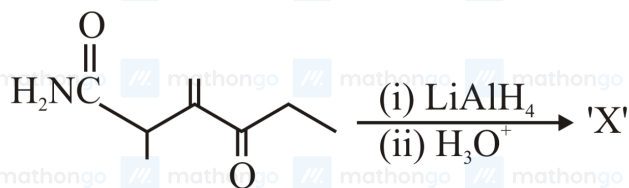
(3)



(4)



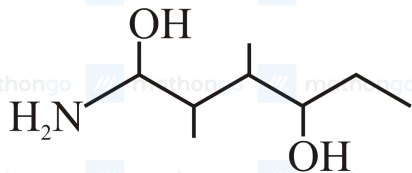
2. In the reaction given below



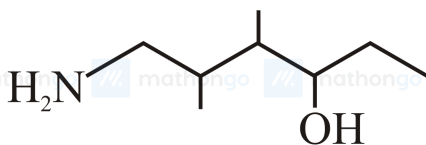
The product 'X' is :

[2023 (10 Apr Shift 2)]

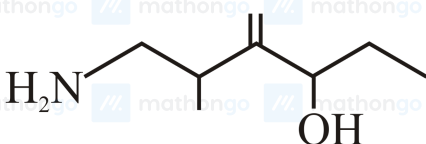
(1)



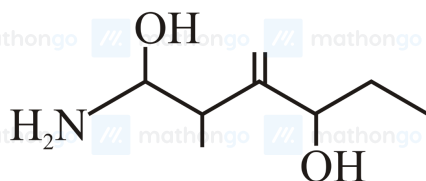
(2)



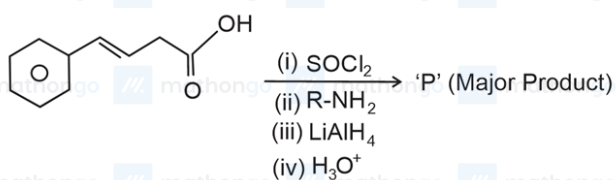
(3)



(4)

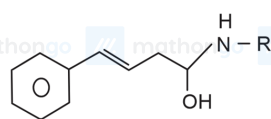


3. The major product 'P' formed in the following sequence of reactions is

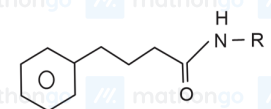


[2023 (12 Apr Shift 1)]

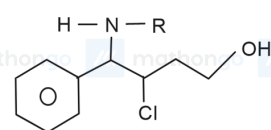
(1)



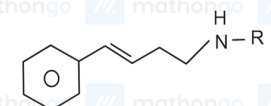
(2)



(3)



(4)



ANSWER KEYS

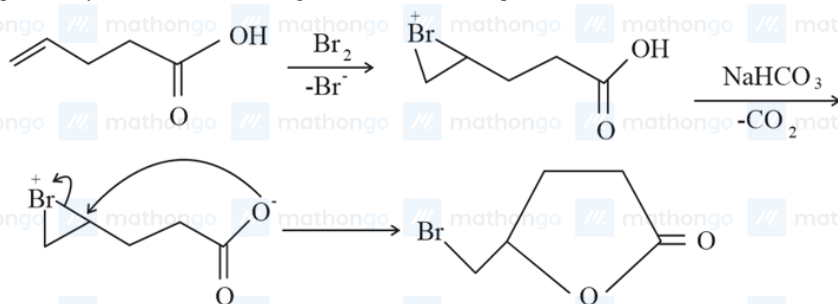
1. (3)

2. (3)

3. (4)

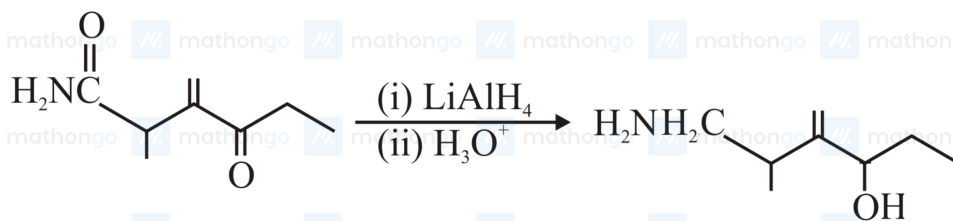
1. (3)

In the first step bromine attacks the carbon-carbon double bond by electrophilic addition reaction mechanism and forms the bromonium cyclic intermediate. In the presence of sodium bicarbonate carboxylic acid group present in the reactant converts to carboxylate ion. This carboxylate ion opens the cyclic bromonium ion ring and forms the desired product.



2. (3)

Lithium aluminium hydride, is a reducing agent that is commonly used in modern organic synthesis. It is a nucleophilic reducing agent that is best suited for reducing multiple polar bonds such as $C=O$. It can reduce carbonyl compounds to alcohols and amides to amines. $C=C$ is not effected during this reaction.



3. (4)

$SOCl_2$ is a halogenating agent. The carboxylic acid group of reactant changes to acid chloride. The acid chloride formed reacts with primary amine to give secondary amide. The secondary amide undergo reduction with lithium aluminium hydride to give secondary amine.

