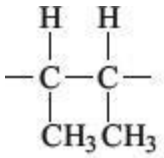
Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: AminoAcids, Proteins & DNA

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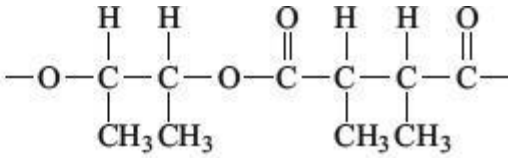
Name of the Student:_____
Max. Marks : 29 Marks **Time : 29 Minutes**

Q1.

(a) The repeating units of two polymers, **P** and **Q**, are shown below.



P



Q

(i) Draw the structure of the monomer used to form polymer **P**. Name the type of polymerisation involved.

Structure of monomer

Type of polymerisation _____

(ii) Draw the structures of **two** compounds which react together to form polymer **Q**. Name these **two** compounds and name the type of polymerisation involved.

Structure of compound 1

Name of compound 1 _____

Structure of compound 2

Name of compound 2 _____

Type of polymerisation _____

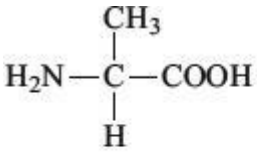
(iii) Identify a compound which, in aqueous solution, will break down polymer **Q** but not polymer **P**.

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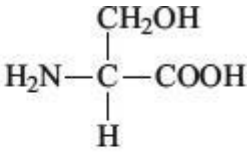
_____

(8)

(b) Draw the structures of the **two** dipeptides which can form when one of the amino acids shown below reacts with the other.



Structure 1



Structure 2

(2)

(c) Propylamine, $CH_3CH_2CH_2NH_2$, can be formed either by nucleophilic substitution or by reduction.

(i) Draw the structure of a compound which can undergo nucleophilic substitution to form propylamine.

(ii) Draw the structure of the nitrile which can be reduced to form propylamine.

(iii) State and explain which of the two routes to propylamine, by nucleophilic substitution or by reduction, gives the less pure product. Draw the structure of a compound formed as an impurity.

Route giving the less pure product _____

Explanation _____

_____

Structure of an impurity

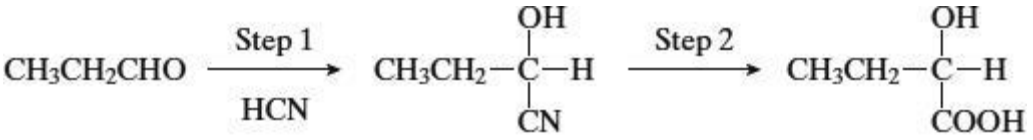
(5)

(Total 15 marks)

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Q2.

Consider the reaction sequence shown below.



propanal Q

(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.

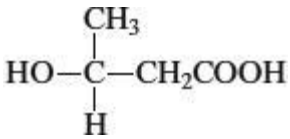
Structures of isomers

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Type of stereoisomerism _____

(4)

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



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

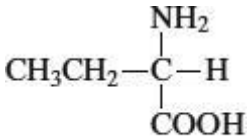
(ii) Suggest a reason why the polymer is biodegradeable.

_____

_____

(2)

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



R

(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.

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

_____

(3)

(Total 14 marks)

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