Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Polymers

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

Which polymer has hydrogen bonding between its chains?

A Kevlar ⬭
B Polythene ⬭
C PVC ⬭
D Terylene ⬭

(Total 1 mark)

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Q2.

The outer layers of some golf balls are made from a polymer called polyisoprene.
The isoprene monomer is a non-cyclic branched hydrocarbon that contains 88.2 % carbon by mass.
The empirical formula of isoprene is the same as its molecular formula.

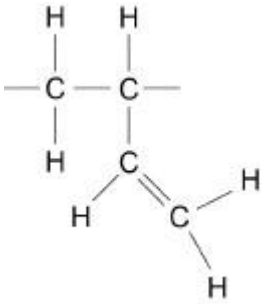
(a) Deduce the molecular formula of isoprene and suggest a possible structure.

Molecular formula _____

Structure

(4)

(b) The insides of some golf balls are made from a mixture of three other polymers.
The repeating unit for one of these polymers is shown.



Draw the skeletal formula of the monomer used to make this polymer.

Give the IUPAC name of the monomer.

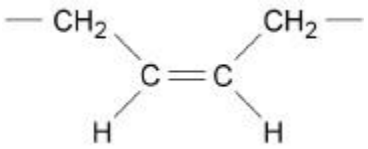
Skeletal formula of monomer

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IUPAC name _____

(2)

(c) A second polymer in the mixture has a repeating unit with the structure shown.



The third polymer in the mixture is a stereoisomer of this polymer.

Draw the structure of the repeating unit of the third polymer.

Give a reason why this type of stereoisomerism arises.

Repeating unit

Reason _____

_____

_____

(2)

(d) Golf balls recovered from lakes and ponds can be used again even after being in water for several years.

Explain why these golf balls do not biodegrade.

_____

_____

_____

(1)

(Total 9 marks)

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Q3.

The repeating unit of a polymer is shown.



Which monomer or pair of monomers could be used to make this polymer?

A $ClOC(CH_2)_4NH_2$ only ⬭

B $ClOC(CH_2)_4COCl$ only ⬭

C $ClOC(CH_2)_4COCl$ and $H_2N(CH_2)_6NH_2$ ⬭

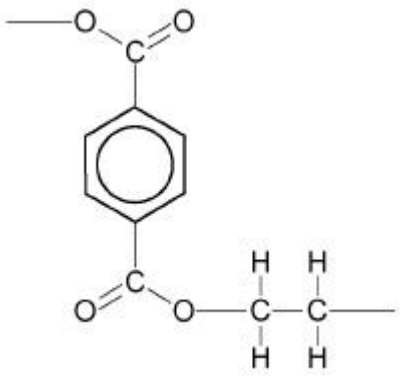
D $ClOC(CH_2)_6COCl$ and $H_2N(CH_2)_4NH_2$ ⬭

(Total 1 mark)

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Q4.

The structure of part of a polyester chain is shown.



Which statement correctly explains why plastics made from this polyester only soften at high temperatures?

A Hydrogen bonds and van der Waals' forces exist between polyester chains. ⬭

B Permanent dipole-dipole forces and van der Waals' forces exist between polyester chains. ⬭

C The carbon-carbon bonds in the chain are strong. ⬭

D The carbon-oxygen bonds in the chain are strong. ⬭

(Total 1 mark)

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Q5.

Which compound can form a polymer without needing another reagent?

A $HOCH_2CH_2OH$ ⬭

B $HOOCCH_2CH_2COOH$ ⬭

C $HOCH_2CH_2COCl$ ⬭

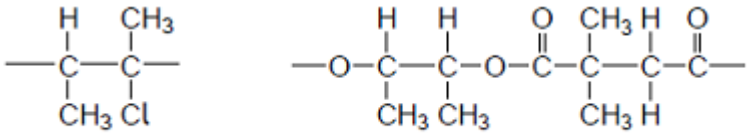
D $ClCH_2CH_2COOH$ ⬭

(Total 1 mark)

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Q6.

Repeating units of two polymers, **P** and **Q**, are shown in the figure below.



P

Q

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

Monomer

Type of polymerisation

_____

(2)

(b) Draw the structures of **two** compounds that react together to form polymer **Q**.

Structure of compound 1

Structure of compound 2

(2)

(c) Suggest an environmental advantage of polymer **Q** over polymer **P**.
Justify your answer.

Advantage _____

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Justification _____

_____

_____

_____

_____

(3)

(Total 7 marks)

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