

10: Organic 2 – Topic questions

Paper 4

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
6	2016	November	41
6	2016	November	43

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

6 Nylon, *Terylene* and proteins are all polymers.

(a) What is a polymer?

.....
.....
..... [2]

(b) Proteins are natural polymers. Proteins are biodegradable.

(i) Name the type of linkage in proteins.

..... [1]

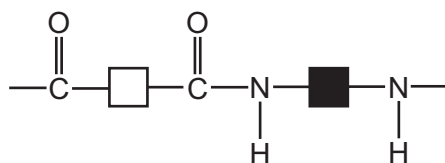
(ii) What is meant by the term *biodegradable*?

.....
.....
..... [2]

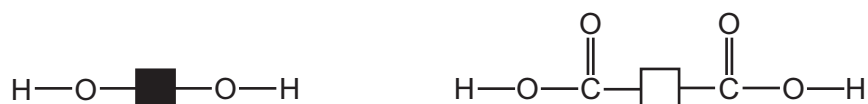
(iii) Name another natural polymer.

..... [1]

- (c) Nylon and *Terylene* are synthetic polymers.
The repeat unit of nylon can be shown as



Terylene can be made from the monomers shown.



Draw a diagram to show the repeat unit of *Terylene*.

[3]

[Total: 9]

6 Synthetic polyamides are made by condensation polymerisation.

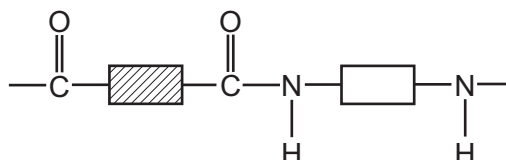
(a) (i) What is meant by the term *condensation polymerisation*?

.....
.....
..... [3]

(ii) Name another type of polymerisation.

..... [1]

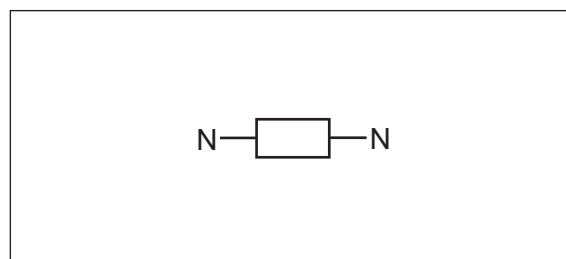
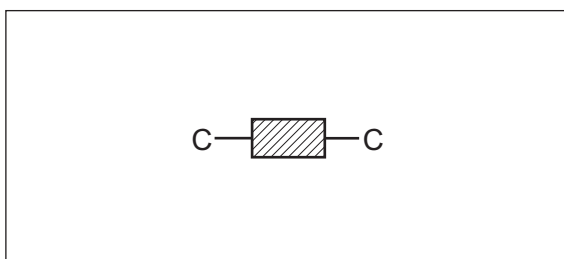
(b) One repeat unit of a synthetic polyamide is represented by the following structure.



(i) Draw a ring around the amide link.

[1]

(ii) Complete the diagrams to show the structures of the monomers used to produce the synthetic polyamide. Show all the missing atoms and bonds.



[2]

(iii) Name an example of a synthetic polyamide.

..... [1]

(c) Proteins and synthetic polyamides have similarities and differences.

(i) Name the type of compounds that are the monomers used to make up proteins.

..... [1]

- (ii) Starting with a sample of protein, describe how to produce, separate, detect and identify the monomers which make it up.

Your answer should include

- the name of the process used to break down the protein into its monomers,
- the name of the process used to separate the monomers,
- the method used to detect the monomers after they have been separated,
- the method used to identify the monomers after they have been separated.

.....

.....

.....

.....

..... [4]

[Total: 13]

Question	Answer	Marks
6 (a)	large / big molecule	1
	made from (many) monomers (joined together)	1
6 (b) (i)	amide / peptide	1
6 (b) (ii)	(can be) broken down	1
	by microbes / bacteria	1
6 (b) (iii)	starch / cellulose / DNA / RNA / polysaccharides	1
6 (c)	M1 at least one correct ester linkage between boxes	1
	M2 at least two boxes shown and sufficient correct C and O atoms to make two correct ester linkages	1
	M3 continuation bond(s) AND if more than one repeat unit is shown, the repeat unit must be correctly identified	1
		Total: 9
6 (a) (i)	<i>condensation:</i> M1 (two) molecules / monomers joining M2 with the removal of a (small) molecule <i>polymerisation:</i> M3 (to form) a large molecule / a long chain	3
6 (a) (ii)	addition	1
6 (b) (i)	circled amide link	1
6 (b) (ii)	all missing atoms and bonds shown on the diacid	1
	all missing atoms and bonds shown on the diamine	1
6 (b) (iii)	nylon / Kevlar / Nomex	1
6 (c) (i)	amino acids	1
6 (c) (ii)	hydrolysis	1
	chromatography	1
	(spray with) locating agent / UV	1
	determine R_f values / compare with standards	1
		Total: 13