nelsonnet

Chapter test with answers

Chapter 7 Molecules for living

Time permitted: 50 minutes

	Section	Number of questions	Marks available
A	Multiple choice	15	15
B	Short answer	5	15
	Total	**20**	**30**

Scale:

A+	29–30	**A**	26–28	**B**	23–25	**C**	19–22	**D**	15–18	**E**	9–14	**UG**	0–8

Section A Multiple choice (15 marks)

Section A consists of 15 questions, each worth one mark. Each question has only one correct answer. Circle the correct answer. Attempt all questions. Marks will not be deducted for incorrect answers. You are advised to spend no more than 15 minutes on this section.

1 Monomers are:
- **A** molecules that are found within a polymer.
- **B** short polymers.
- **C** *molecules that react to form polymers.*
- **D** individual polymer links.

2 Which of the following polymers is not natural?
- **A** Silk
- **B** Wool
- **C** DNA
- **D** *Nylon*

3 In the 1950s a new material was invented called plastic, but polymers were first mentioned by whom and in what year?
- **A** *Herman Staudinger in 1922*
- **B** Albert Einstein in 1905
- **C** Karl Ziegler in 1949
- **D** Guilo Natta in 1933

4 Addition polymerisation occurs from:
- **A** monomers with single bonds only.
- **B** polymers with single bonds.
- **C** *monomers with double bonds.*
- **D** polymers with double bonds.

5 Which statement about polymers is true?
- **A** Addition polymers are biodegradable.
- **B** *Condensation polymers are biodegradable.*
- **C** Condensation polymers are not biodegradable.
- **D** None of the above

6 Thermoplastic polymers:
- **A** are recyclable because they can be dissolved and reused.
- **B** are not recyclable because they will not dissolve.
- **C** are not recyclable because they cannot be melted.
- **D** *are recyclable because they can be melted and remoulded.*

7 What is the most widely used monomer?
- **A** Polythene
- **B** *Ethene*
- **C** Methene
- **D** Propene

8 Addition polymers:
- **A** *are made from one type of monomer.*
- **B** are composed from various monomers competing with each other.
- **C** are made from two different monomers reacting together.
- **D** can only form polythene.

9 Polyethylene:
- **A** was discovered just before World War II.
- **B** is also known as polythene.
- **C** *was invented during World War II.*
- **D** was invented after World War II.

10 Polymers with low crystallinity are:
- **A** *softer and have low melting points.*
- **B** opaque and hard.
- **C** non-permeable.
- **D** not useful.

11 Condensation polymers:
- **A** produce water.

B *do not require double bonds to form polymers.*

C are limited to polyester plastics.

D require water to catalyse the reaction.

12 Polysaccharides:

A are made from starch.

B *are sugar polymers.*

C are copolymers.

D produce starch and cellulose.

13 Monosaccharides are:

A lipids.

B glucose.

C *sugars.*

D esters.

14 The arrangement of side groups on a polymer enhances or weakens intermolecular bonds; the arrangement of methyl groups from weakest to strongest is:

A *atactic, syndiotactic and isotactic.*

B isotactic, syndiotactic and atactic.

C syndiotactic, atactic and isotactic.

D isotactic, atactic and syndiotactic.

15 Proteins are essential to life and found in all living things, some examples include:

A amino acids, DNA, insulin, haemoglobin.

B DNA, insulin, haemoglobin, glycine.

C *DNA, insulin, haemoglobin, polypeptides.*

D DNA, insulin, zwitterions, collagen.

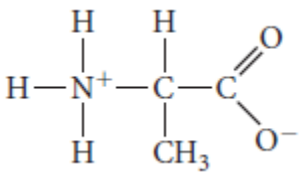
Section B Short answer (15 marks)

Section B consists of five questions. Write your answers in the spaces provided. You are advised to spend 20 minutes on this section.

1 There are many amino acids; alanine is just one of them. Using this molecule as an example:

a show the zwitterion formed by the amino acid.

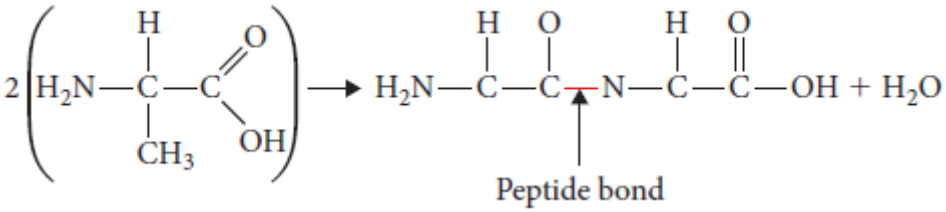
Answer:



(1 mark)

b show how amino acids form a polymer.

Answer:



(1 mark)

c give the systemic name for alanine.

Answer: Alanine is also known as 2-aminopropanoic acid (1 mark)

(= 3 marks total)

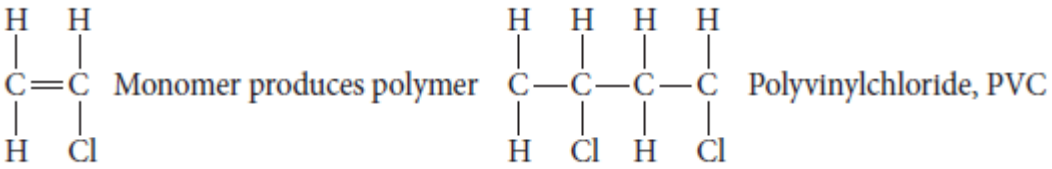
2 The molecule CH_2CHCl is used to form a polymer.

a Name this molecule, both by its traditional name and its IUPAC name.

Answer: Vinyl chloride (traditional name) and chloroethene (1 mark)

b Draw a section of the polymer made from this molecule and name it.

Answer:



(1 marks)

c Name the type of polymerisation used to produce this polymer.

Answer: Addition polymerisation produces the polymer. (1 mark)

(= 3 marks total)

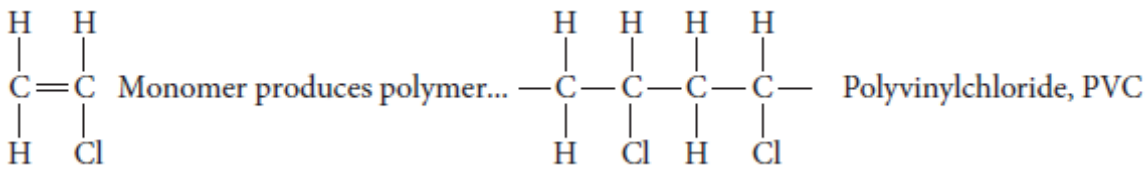
3 The molecule CH_2CHCl is used to form a polymer.

a Name this molecule, both its traditional name and IUPAC name.

Answer: Vinyl chloride (traditional name) and chloroethene (1 mark)

b Draw a section of the polymer made from this molecule and name it.

Answer:



(1 mark)

c Name the type of polymerisation used to produce this polymer.

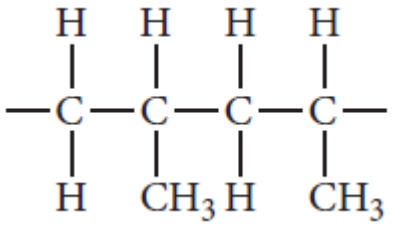
Answer: Addition polymerisation produces the polymer. (1 mark)

(= 3 marks total)

4 Draw two repeating units of the polymer produced by the following alkenes:

a propene

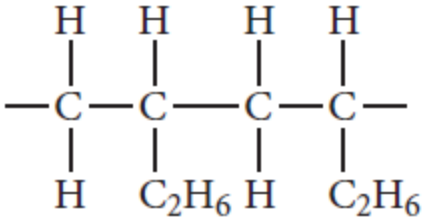
Answer:



(1 mark)

b but-1-ene

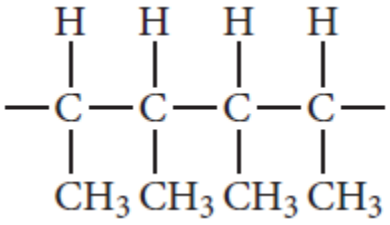
Answer:



(1 mark)

c but-2-ene.

Answer:



(1 mark)

(= 3 marks total)

5 Name three types of bonding involved in protein structures and describe how each type of bond works.

Answer: Any of:

H bonding between bases and in secondary structure

Peptide bonding in proteins caused by polymerisation of amino acids

Dispersion forces between non polar chains on amino acids

Ionic attraction between ions on ends of amino acids in acidic conditions

(= 3 marks total)