

4. Biological Molecules

(Past Year Topical Questions 2010-2015)

May/June 2010 (11)

13 Which solutions are used for testing for protein, reducing sugar and starch?

	test for protein	test for reducing sugar	test for starch
A	Benedict's	iodine	biuret
B	biuret	Benedict's	iodine
C	biuret	iodine	Benedict's
D	iodine	biuret	Benedict's

14 A protease is added to a suspension of egg protein in a test-tube and kept at 37 °C.

After 8 minutes, the protein changes from cloudy to transparent.

Which product, or products, will now be present in the test-tube?

- A amino acids
- B a simple sugar
- C fatty acids and glycerol
- D water

Oct/Nov 2010 (11)

- 11** Six test-tubes were set up at different temperatures. Each contained identical solutions containing starch and amylase mixtures. The table shows the time taken for the reactions to finish in each test-tube.

temperature / °C	15	25	35	45	55	65
time / seconds	35	22	13	5	35	66

At which temperature does the amylase work best?

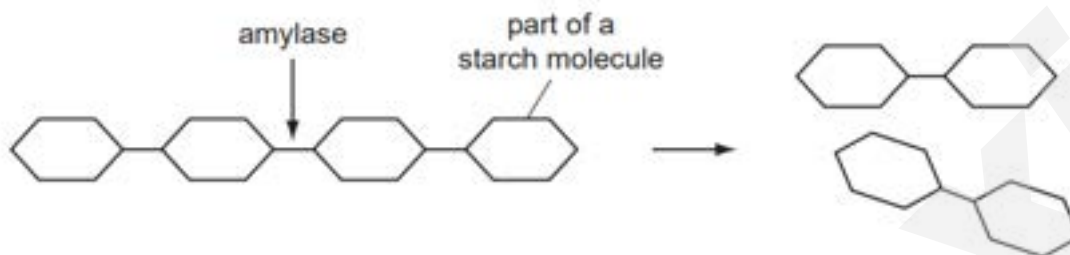
- A** 15 °C **B** 35 °C **C** 45 °C **D** 65 °C
- 12** What does the digestion of starch produce?
- A** fatty acids
B glucose
C mineral salts
D water
- 16** Nutrients are made up of smaller basic units. Nutrients can be identified by food tests.

Which nutrient is a protein?

nutrient	smaller basic units	food test
A	amino acids	Benedict's test
B	amino acids	biuret test
C	sugars	Benedict's test
D	sugars	biuret test

Oct/Nov 2011 (11)

12 The diagram shows the action of amylase.



What is the function of the enzyme amylase?

- A breaks down the substrate into amino acids
 - B changes the product into the substrate
 - C increases the rate of starch breaking down into glucose
 - D increases the rate of starch breaking down into maltose
- 14 Small molecules are used as the basic units in the synthesis of large food molecules.
- Which statement is correct?
- A Amino acids are basic units of carbohydrates.
 - B Fatty acids are basic units of glycogen.
 - C Glycerol is a basic unit of oils.
 - D Simple sugar is a basic unit of protein.

May/June 2012 (12)

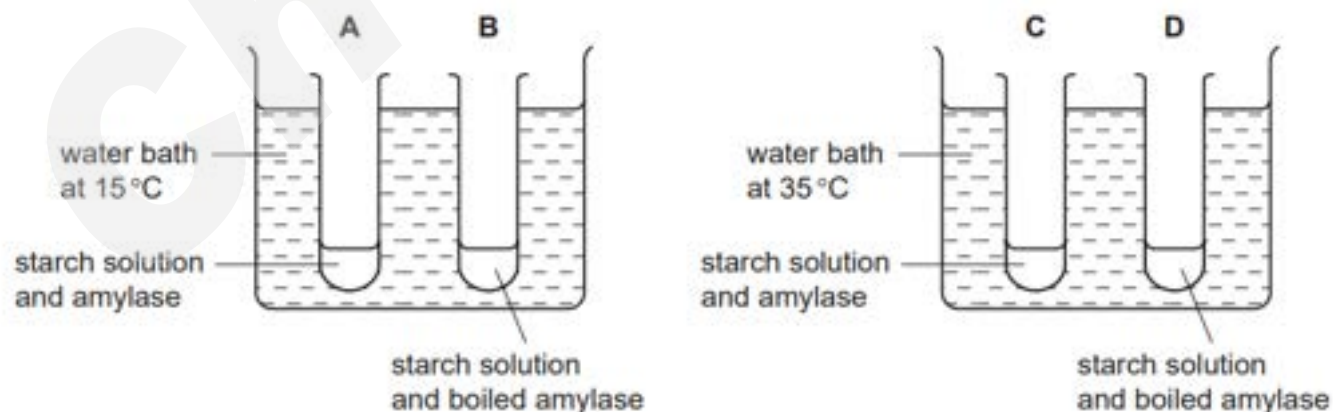
- 11 Equal quantities of a protein-digesting enzyme were added to 5cm³ of protein solutions of different pH. Each tube was kept at 37 °C. The amount of amino acid in each tube was measured after 3 minutes. The results are shown in the table.

pH	amount of amino acid /arbitrary units
1	10
2	9
3	7
4	2
5	1
6	1
7	1
8	0

At which pH was the enzyme most active?

- A 1 B 7 C 8 D 10
- 12 Four test-tubes were set up as shown in the diagram.

In which tube is the starch digested most quickly?



14 The table shows the colour of a biuret solution before and after a food test was carried out.

colour of solution before food test	colour of solution after food test
blue	lilac / purple

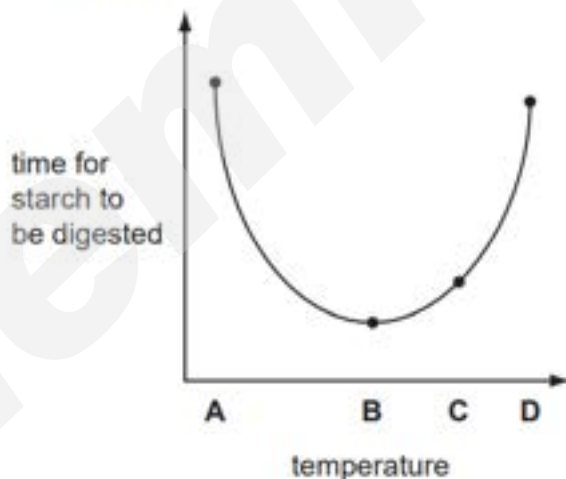
Which nutrient was present?

- A fat
- B protein
- C reducing sugar
- D starch

Oct/Nov 2012 (13)

13 Four identical mixtures of starch and amylase were kept at different temperatures. The graph shows the time taken for the starch to be completely digested at each temperature.

At which temperature is the rate of reaction quickest?



14 Which nutrient produces a purple colour when mixed with biuret solution?

- A fat
- B protein
- C reducing sugar
- D starch

May/June 2013 (11)

12 A human cell contains a length of DNA that carries the code for making which substance?

- A fat
- B glycogen
- C lipase
- D starch

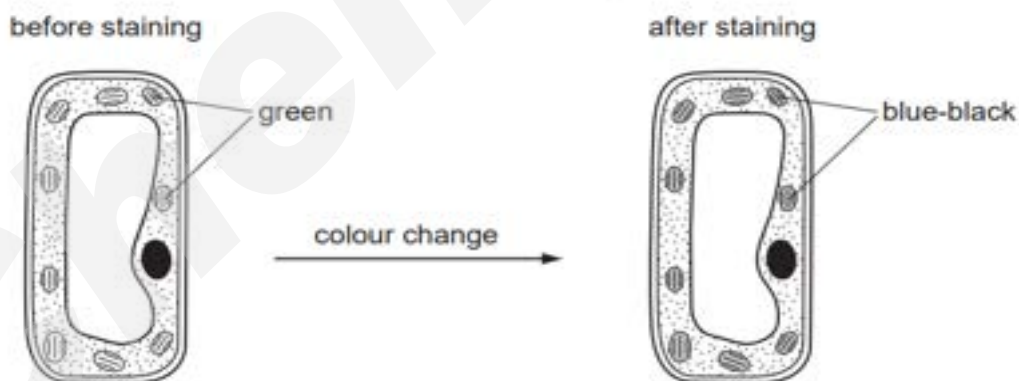
13 A student set up a test-tube containing starch, water and amylase.

How could the student test whether the amylase had digested all the starch?

- A Add Biuret solution.
- B Add dilute hydrochloric acid.
- C Add iodine solution.
- D Weigh the test-tubes and contents before and after the experiment.

Oct/Nov 2013 (11)

5 The diagrams show a leaf cell before and after staining with iodine solution.

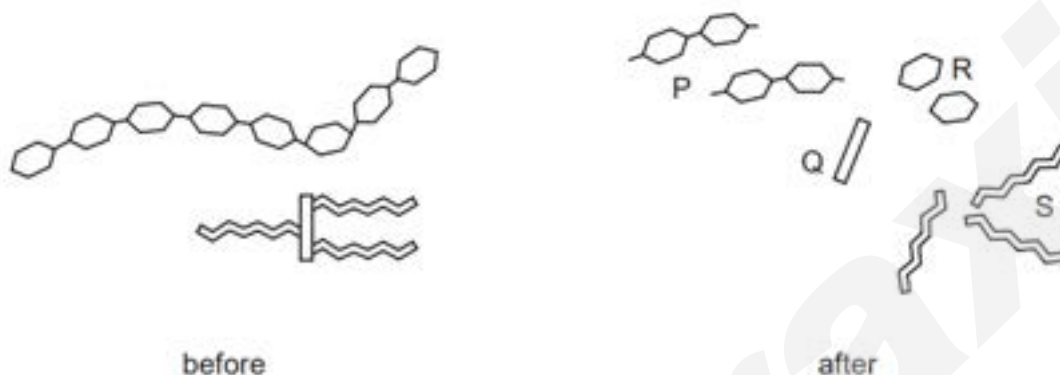


Which substance causes the iodine solution to change colour?

- A chlorophyll
- B protein
- C reducing sugar
- D starch

Oct/Nov 2013 (11)

14 The diagram shows two food molecules before and after they have been digested by enzymes.



What identifies the products of fat digestion?

- A** P and R **B** P and S **C** Q and R **D** Q and S

15 Four foods were tested for each of the following nutrients:

fat (using ethanol);

protein (using the biuret test);

reducing sugar (using Benedict's solution),

Which food contains protein and fat?

	colour of result of food test		
	purple/lilac	brick-red/orange	milky-white
A	✓	x	✓
B	✓	x	x
C	x	✓	✓
D	x	✓	x

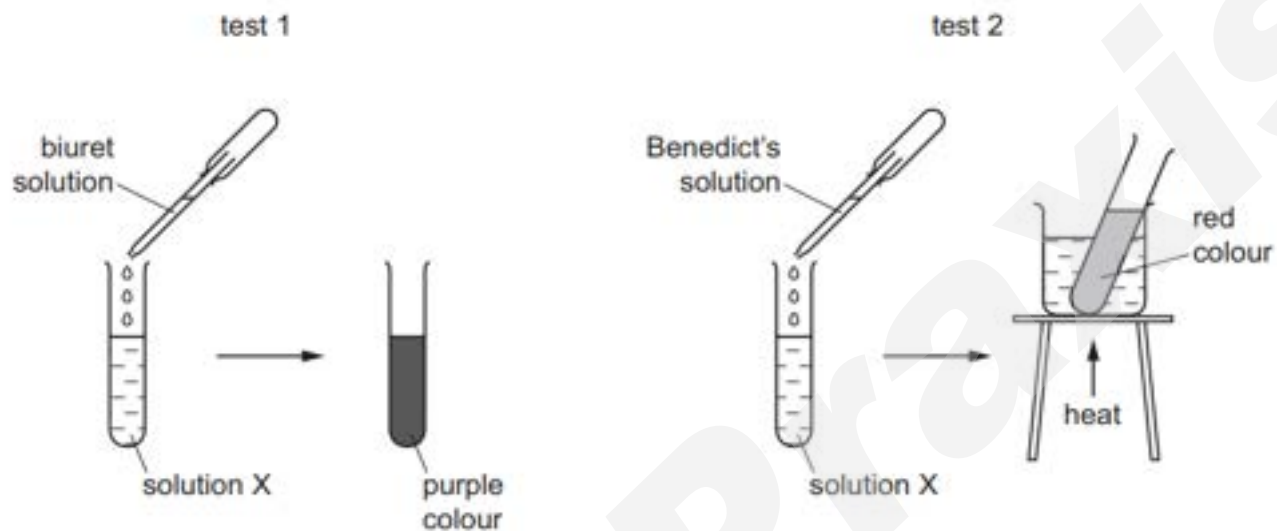
key

✓ = nutrient present

x = nutrient absent

May/June 2014 (11)

13 The diagram shows two food tests carried out on solution X.



Which nutrients are present in solution X?

- A protein and starch
- B protein and sugar
- C starch and fat
- D starch and sugar

May/June 2014 (12)

13 The data show the concentrations of sugar and starch in an onion.

total sugar including reducing sugar /g per 100g	starch /g per 100g
3.7	0

The onion is tested with Benedict's solution and iodine solution.

Which set of results is correct?

	Benedict's solution	iodine solution
A	blue	blue-black
B	blue	brown
C	brick red	blue-black
D	brick red	brown

Oct/Nov 2014 (11)

13 Which simple molecules are the basic units of protein?

- A** amino acids
- B** fatty acids
- C** sugars
- D** vitamins

Oct/Nov 2014 (13)

12 Which food-testing reagent shows a positive result when it turns from blue to purple?

- A Benedict's solution
- B biuret reagent
- C ethanol
- D iodine solution

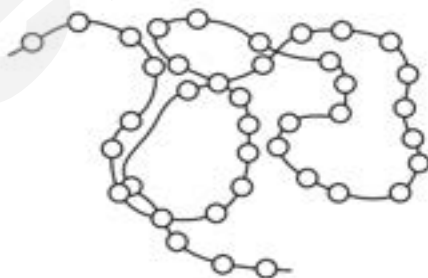
May/June 2015 (11)

4 The key can be used to distinguish between four different chemical substances.

Use the key to identify which substance could be a protein.

- 1 contains the element carbon go to 2
- does not contain carbon **A**
- 2 contains the element nitrogen **B**
- does not contain nitrogen go to 3
- 3 gives a positive result with Benedict's test **C**
- gives a negative result with Benedict's test **D**

14 The diagram represents a protein molecule.



What do the small circles represent?

- A amino acids
- B fatty acids
- C glycerol
- D simple sugars

May/June 2015 (12)

- 13 Which row shows the elements and basic units that are used in the construction of large food molecules?

	food molecules	elements	basic units
A	fats	carbon, hydrogen, oxygen, nitrogen	glucose
B	fats	carbon, hydrogen, oxygen, nitrogen	glycerol
C	starch	carbon, hydrogen, oxygen	glucose
D	starch	carbon, hydrogen, oxygen	glycerol

Oct/Nov 2015 (13)

- 12 Four different foods were tested for their composition.

The results are shown in the table.

Which food contains protein but **not** reducing sugar or starch?

	Benedict's test	iodine test	biuret test
A	blue	black	purple
B	blue	brown	purple
C	brick red	black	blue
D	brick red	brown	blue

- 13 What are the smaller basic units of starch and glycogen molecules?

	starch	glycogen
A	amino acids	fatty acids and glycerol
B	amino acids	simple sugars
C	simple sugars	fatty acids and glycerol
D	simple sugars	simple sugars