

Biological Molecules

Question Paper 3

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Biological Molecules
Sub Topic	
Booklet	Multiple Choice
Paper Type	Question Paper 3

Time Allowed : 29 minutes

Score : / 24

Percentage : /100

Grade Boundaries:

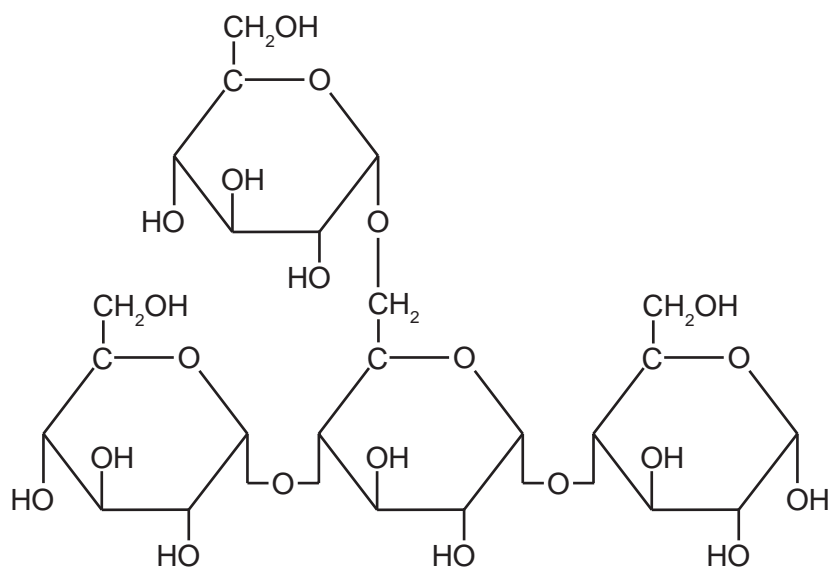
A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Which statements about amylopectin and glycogen are correct?

- 1 both contain 1-4 glycosidic bonds
- 2 amylopectin contains β -glucose
- 3 glycogen contains more 1-6 branches than amylopectin

A 1 only **B** 1 and 2 **C** 1 and 3 **D** 2 and 3

2 The diagram shows part of a carbohydrate molecule.



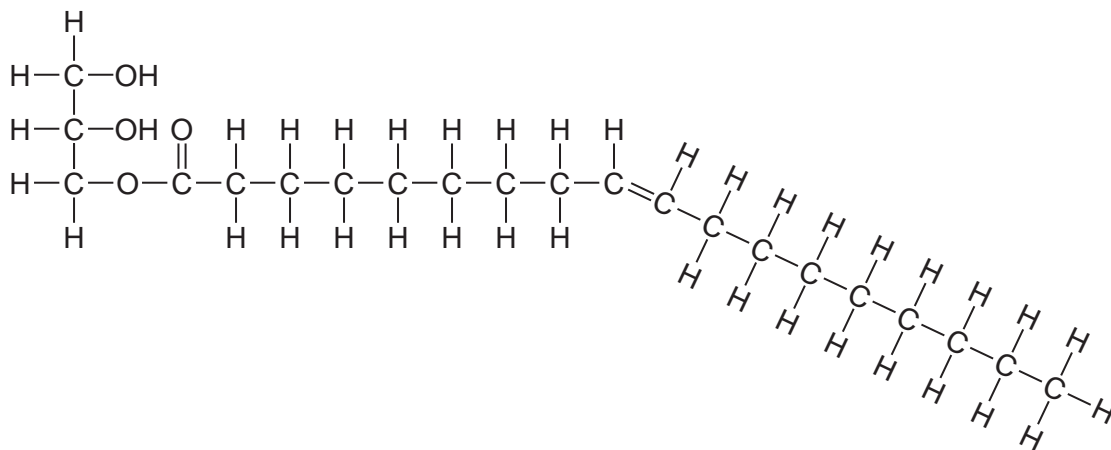
If all the 1,4 glycosidic bonds in this molecule are hydrolysed, how many water molecules will be used and how many separate glucose molecules will be produced?

	number of water molecules used	number of glucose molecules produced
A	1	1
B	2	2
C	3	3
D	4	4

3 Which combination of procedures would **not** be used in a food test?

	use heat	use biuret reagent	use Benedict's reagent	boil with dilute acid
A	✓		✓	
B	✓	✓		
C	✓		✓	✓
D		✓		

4 The diagram shows a triglyceride molecule that has been partially hydrolysed.



What will be the products of the total hydrolysis of the molecule shown?

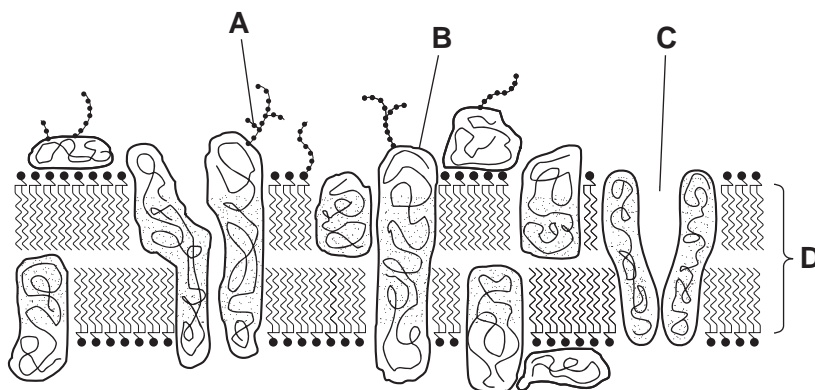
- A** a molecule of glycerol and a saturated fatty acid molecule only
- B** a molecule of glycerol and an unsaturated fatty acid molecule only
- C** a molecule of water, a molecule of glycerol and a saturated fatty acid molecule
- D** a molecule of water, a molecule of glycerol and an unsaturated fatty acid molecule

5 Which statement is true for cellulose, but **not** true for protein?

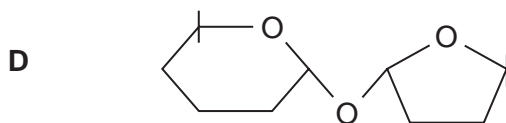
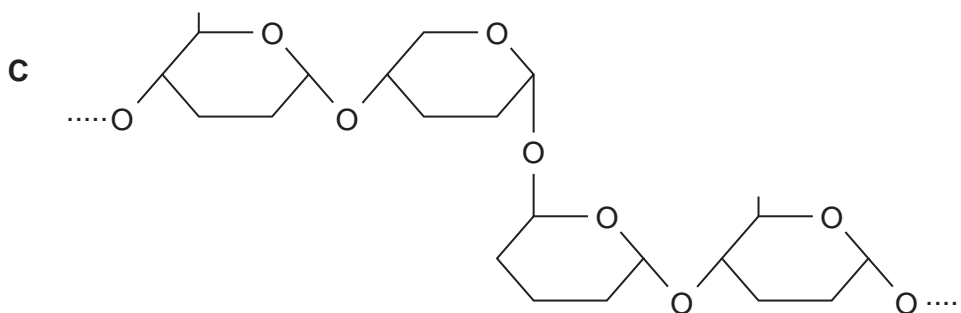
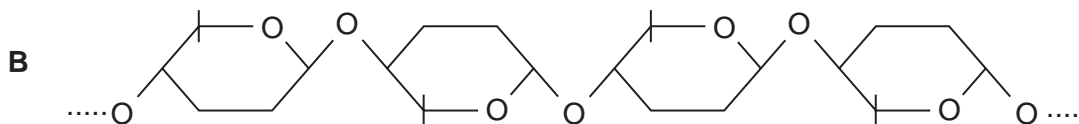
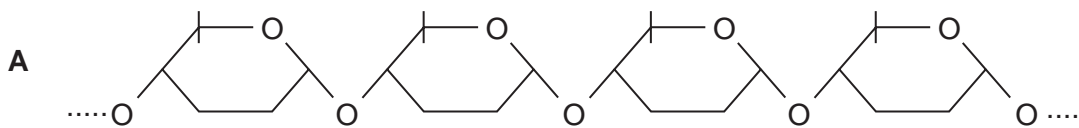
- A It is found in cell surface membranes.
- B It is synthesised from identical sub-units.
- C It is used as an energy source.
- D It may be a structural component.

6 Cystic fibrosis is a disease where Cl^- ions are unable to be transported into cells.

Which structure in the cell surface membrane is faulty?



7 Which diagram shows part of a structural polysaccharide?



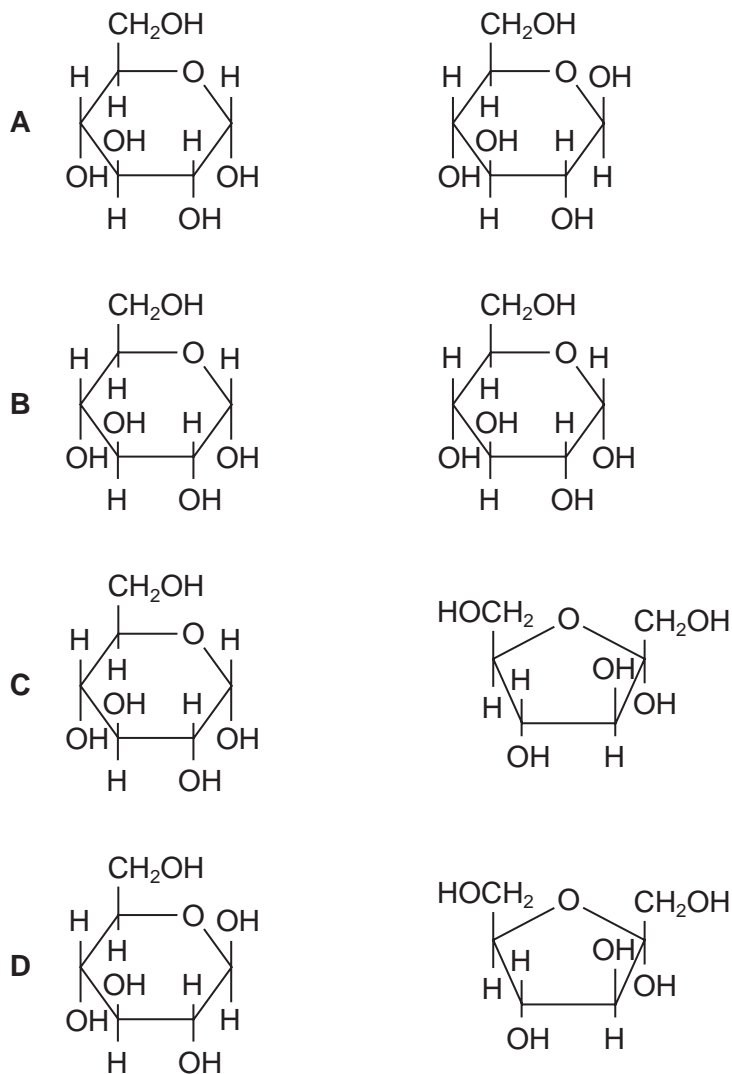
8 Which substances contain carbon, hydrogen, oxygen and nitrogen?

- 1 amylopectin
- 2 collagen
- 3 deoxyribonucleic acid

- A** 2 only
B 1 and 2 only
C 2 and 3 only
D 1,2 and 3

- 9 Sucrose is a disaccharide formed from two hexose sugars, α -glucose (alpha-glucose) and fructose.

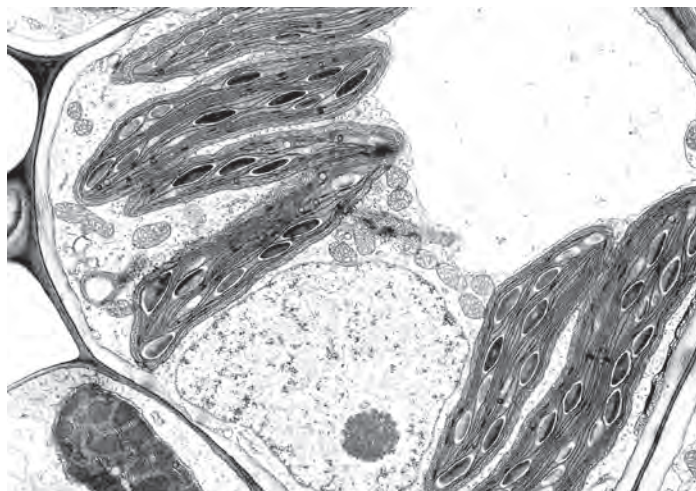
Which pair of monosaccharide structures will be formed when sucrose is hydrolysed?



- 10 Which type of molecule contains disulphide bonds and which contains glycosidic bonds?

	disulphide bonds	glycosidic bonds
A	glycoprotein	polysaccharide
B	nucleic acid	glycoprotein
C	polysaccharide	nucleic acid
D	protein	triglyceride

- 11 The diagram shows a photomicrograph. Its magnification is $\times 2800$.



What is the diameter of the nucleolus?

- A** $2.5\ \mu\text{m}$ **B** $5\ \mu\text{m}$ **C** $10\ \mu\text{m}$ **D** $20\ \mu\text{m}$
- 12 When solutions of dilute sodium hydroxide and copper(II) sulphate (biuret test) were added to an unknown substance, a purple colour was observed.

This test indicates the presence of which bond in the unknown substance?

- A** disulphide
B hydrogen
C ionic
D peptide
- 13 The diagram shows part of a macromolecule in the form of triple helices, lying side by side with covalent cross links between them.



What is the name of the molecule?

- A** cellulose
B collagen
C glycogen
D triglyceride

- 14 Which of the following is a polysaccharide present in human muscle?
- A amylose
 - B collagen
 - C glycogen
 - D haemoglobin
- 15 Which statement is true for cellulose, but **not** true for protein?
- A It is found in cell surface membranes.
 - B It is synthesised from identical sub-units.
 - C It is used as an energy source.
 - D It may be a structural component.
- 16 Heating with which solution breaks glycosidic bonds?
- A Benedict's solution
 - B dilute hydrochloric acid
 - C dilute sodium hydroxide
 - D ethanol
- 17 During the production of apple juice, enzymes are used to break down the components of the cell walls.
- Which carbohydrate will be produced by this hydrolysis?
- A amylose
 - B cellulose
 - C glucose
 - D glycogen

18 What are the features of glycogen?

	contains nitrogen	branched molecule	structural role in cell
A	✓	✓	x
B	✓	x	✓
C	x	✓	x
D	x	x	✓

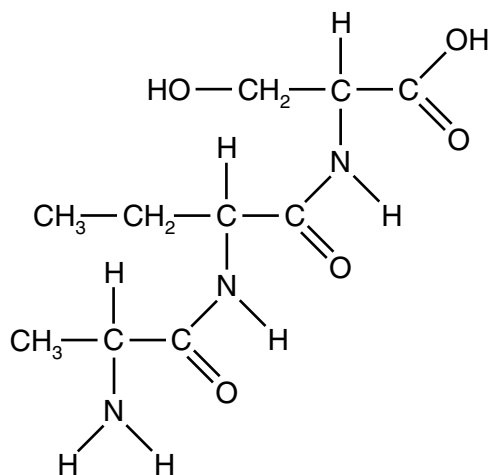
19 What is the name of the bond joining glycerol and a fatty acid in the formation of a monoglyceride?

- A** ester
- B** glycosidic
- C** hydrogen
- D** peptide

20 Which feature distinguishes starch from glycogen?

- A** Starch contains alpha glucose.
- B** Starch contains 1,6 glycosidic bonds.
- C** Starch has an unbranched component.
- D** Starch is a polysaccharide.

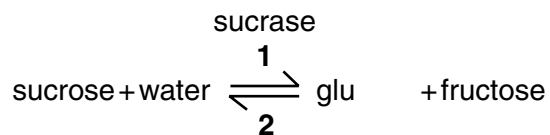
21 The diagram shows a molecule.



Which type of molecule is it?

- A phospholipid
- B triglyceride
- C tripeptide
- D trisaccharide

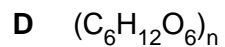
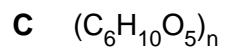
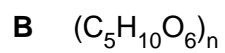
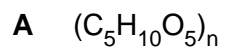
22 The equation shows a reversible reaction.



In this reaction, on which molecule or molecules do active sites occur and what types of reaction occur at **1** and **2**?

	active site present on	reaction at 1	reaction at 2
A	glucose and fructose	condensation	hydrolysis
B	glucose and fructose	hydrolysis	condensation
C	sucrase only	condensation	hydrolysis
D	sucrase only	hydrolysis	condensation

23 What is the general formula for starch?



24 Which molecular bonds will be broken by hydrolysis when a molecule of glycogen is converted to glucose?

	bonds		
	1,2	1,4	1,6
A	✓	✗	✗
B	✗	✓	✓
C	✓	✗	✓
D	✗	✓	✗