Sugars

Question Paper

Level	International A Level
Subject	Biology
Exam Board	Edexcel
Topic	Molecules, Transport and Health
Sub-Topic	Sugar
Booklet	Question paper

Time Allowed: 42 minutes

Score: /35

Percentage: /100

Grade Boundaries:

A*	Α	В	С	D	Е	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

1		_	organisms rely on biological molecules such as polysaccharides and otides.	
			ch of the statements below, put a cross $oxtimes$ in the box that corresponds to rrect statement.	
	(i)		e name of the bonds that join monosaccharides together in a lysaccharide is	(1)
	×	A	Ester	(1)
	\times	В	Glycosidic	
	×	C	Hydrogen	
	×	D	Peptide	
	(ii)		e name of the bonds that join two complementary strands of nucleotides gether in DNA is	(1)
	\times	A	Glycosidic	(1)
	×	В	Hydrogen	
	\times	C	lonic	
	\times	D	Peptide	
	(iii)) Th	e name of the base that is found in RNA but not DNA is	(1)
	X	A	Adenine	(-)
	\times	В	Guanine	
	\times	C	Thymine	
	×	D	Uracil	
	(iv)) If 3	30% of the DNA in a cell consists of guanine, it will also contain	(1)
	\times	A	20% adenine	(-)
	\times	В	30% adenine	
	\times	C	20% cytosine	
	\times	D	30% thymine	

	(Total for Question 1 = 7 marks)
around living organisms.	(3)
around living organisms.	blecule for transporting other molecules

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- **2** Water is an important solvent in biological systems.
 - (a) Put a cross ⋈ in the box that completes each of the following statements.
 - (i) The drawing that represents a molecule of water is

(1)

 \square A δ_{-0} $H^{\circ+}$

B δ+ H δ- Λ δ+

 \square C δ_{-} δ_{-}

 \square **D** δ_+ δ_-

(ii) The intermolecular force that explains many of the important properties of water is

(1)

- A covalent bonding
- B hydrogen bonding
- **D** oxygen bonding

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- (b) The solubility of substances affects how they are transported in the blood.
 - (i) The diagram below shows the structure of a molecule of glucose.

Suggest why glucose is soluble in water.

((ii) Suggest how triglycerides are transported in t	he blood.	
			(2)
		(Total for Ouestion 2 = 5 ma	nrks)

(1)

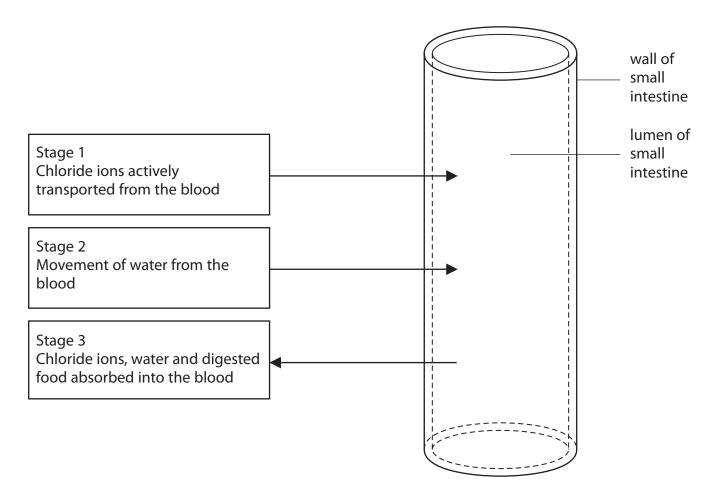
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3 Cholera is a disease caused by the bacterium *Vibrio cholerae*.

This bacterium produces a toxin (choleragen) that binds to the cell surface membranes of the cells lining the intestine. This stimulates an increase in the active transport of chloride ions into the lumen of the intestine.

This results in diarrhoea and the loss of large volumes of fluid from the body.

(a) The diagram below shows the movement of chloride ions, water and digested food through the wall of the small intestine during digestion in a healthy person.



(i) Explain why ATP is needed for the active transport of chloride ions into the lumen of the small intestine.

(2)

cholera loses large volumes of fluid as diarrhoea.	(4)
(iii) Some of the chloride ions are reabsorbed into the blood by facilitated diffusion.	
Compare the processes of facilitated diffusion and active transport.	
	(2)

(b) One way of treating diarrhoea is to use a food-based oral rehydration therapy that

contains a lot of starch and water.

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Suggest why this therapy is effective in the treatment of cholera.

(4)

(Total for Question 3 = 12 marks)

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- **4** The genetic disorder galactosaemia means 'galactose in the blood'.
 - (a) Galactose is a monosaccharide found in lactose. The structure of lactose is shown in the diagram below.

In the space below draw the products of the hydrolysis of lactose.

(2)

*(b) Galactose is broken down by an enzyme called Gal-1-PUT. In some types of

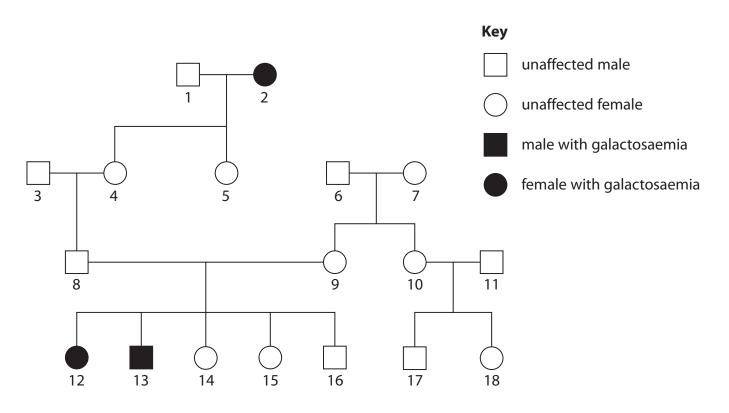
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galactosaemia, this enzyme does not function properly. Explain why a mutation in the gene coding for the enzyme Gal-1-PUT could lead to the inability to break down galactose. (4)

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(c) Galactosaemia is caused by a recessive allele.

The pedigree diagram below shows part of a family in which galactosaemia is an inherited condition.



(i) Explain how this pedigree diagram indicates that galactosaemia is caused by a recessive allele.

(2)

(ii) Using a suitable genetic diagram, calculate the probability that the next child of parents 8 and 9 will have galactosaemia.		
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	1 199	
	probability	
	(Total for Question 4 = 11 m	arks)