

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

1 All living organisms rely on biological molecules such as polysaccharides and polynucleotides.

(a) For each of the statements below, put a cross in the box that corresponds to the correct statement.

(i) The name of the bonds that join monosaccharides together in a polysaccharide is

(1)

A Ester

B Glycosidic

C Hydrogen

D Peptide

(ii) The name of the bonds that join two complementary strands of nucleotides together in DNA is

(1)

A Glycosidic

B Hydrogen

C Ionic

D Peptide

(iii) The name of the base that is found in RNA but not DNA is

(1)

A Adenine

B Guanine

C Thymine

D Uracil

(iv) If 30% of the DNA in a cell consists of guanine, it will also contain

(1)

A 20% adenine

B 30% adenine

C 20% cytosine

D 30% thymine

(b) Explain why water is an effective molecule for transporting other molecules around living organisms.

(3)

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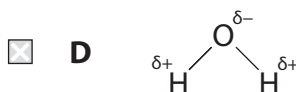
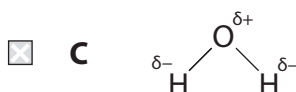
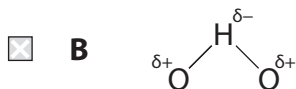
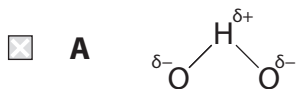
(Total for Question 1 = 7 marks)

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)



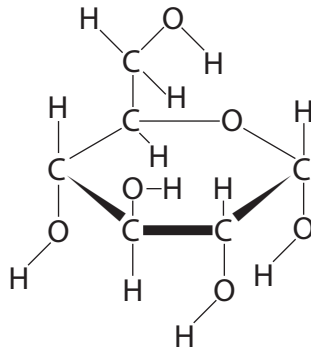
(ii) The intermolecular force that explains many of the important properties of water is

(1)

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

(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.

(1)

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(ii) Suggest how triglycerides are transported in the blood.

(2)

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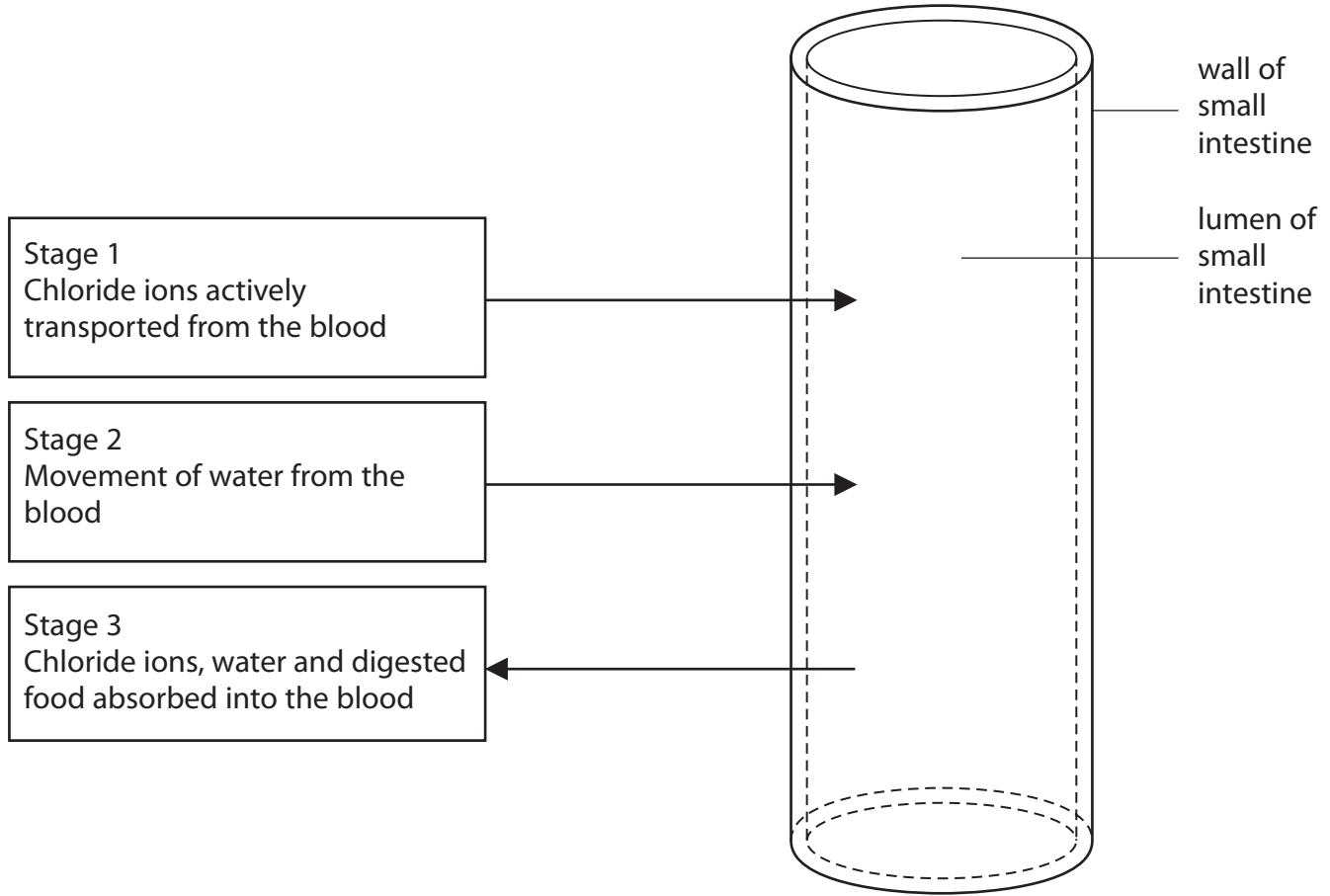
(Total for Question 2 = 5 marks)

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

This bacterium produces a toxin (cholera toxin) 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)

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(b) One way of treating diarrhoea is to use a food-based oral rehydration therapy that contains a lot of starch and water.

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

(4)

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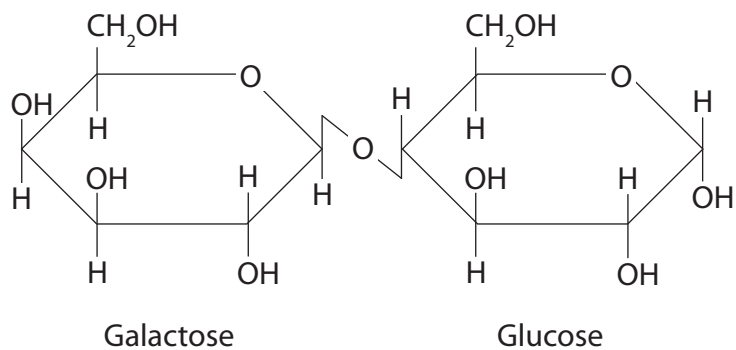
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(Total for Question 3 = 12 marks)

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)

- (ii) Using a suitable genetic diagram, calculate the probability that the **next** child of parents 8 and 9 will have galactosaemia.

(3)

probability

(Total for Question 4 = 11 marks)