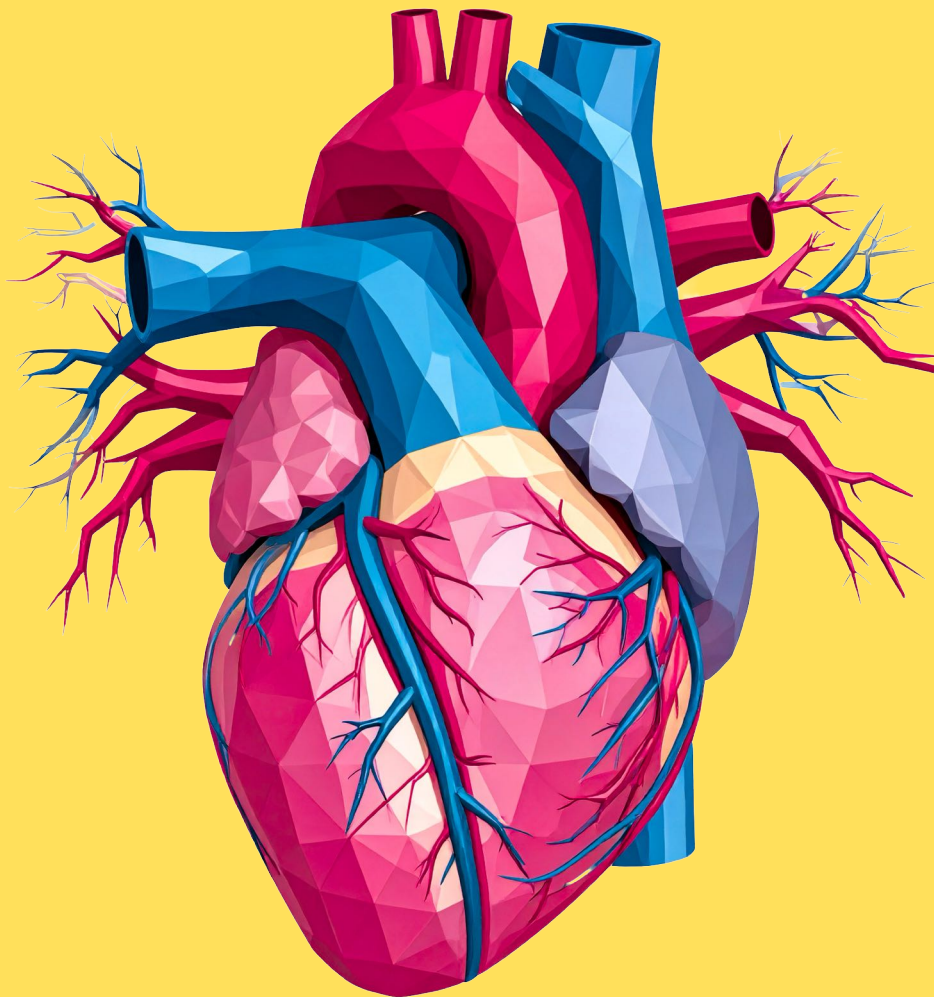


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AS
Biology



Unit 1
Topical Questions
Examiner's Insight Edition

Edexcel IAL Biology

Unit 1 (WBI11/01) · Questions by Topic

Past-paper questions classified by topic · [click a chapter to jump](#)

1.	Water and carbohydrates	16 questions
2.	Lipids and proteins	11 questions
3.	Enzymes	8 questions
4.	Biological membranes	8 questions
5.	Movement across the membrane	11 questions
6.	Nucleic acids	10 questions
7.	Protein synthesis	9 questions
8.	Genetics	26 questions
9.	The heart and circulation	18 questions
10.	Haemoglobin and blood clotting	17 questions
11.	Cardiovascular disease and its treatment	28 questions

Chapter 1

Water and carbohydrates

- | | |
|-----------------------------|-------------|
| · Water | 7 questions |
| · Sugars & glycosidic bonds | 4 questions |
| · Polysaccharides | 5 questions |

Water

Edexcel IAL Biology - Solved Past Paper

June 2019 · Unit 1 (WBI11/01) · Question 1 · Water as a solvent - dipole & solubility

● hard ● medium ● easy

● 1 (a)

Draw · [2 marks]

Draw a diagram of a water molecule to show its dipole nature.

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● 1 (b)(i)

Describe · [3 marks]

Describe the effect of temperature on the solubility of the three salts F, G and H.

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● 1 (b)(ii)

Calculate · [1 mark]

How many times more soluble is salt G than salt H at 30 °C?

- ☐ A 15.00
- ☐ B 1.67
- ☐ C 1.50
- ☐ D 0.60

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Edexcel IAL Biology - Solved Past Paper

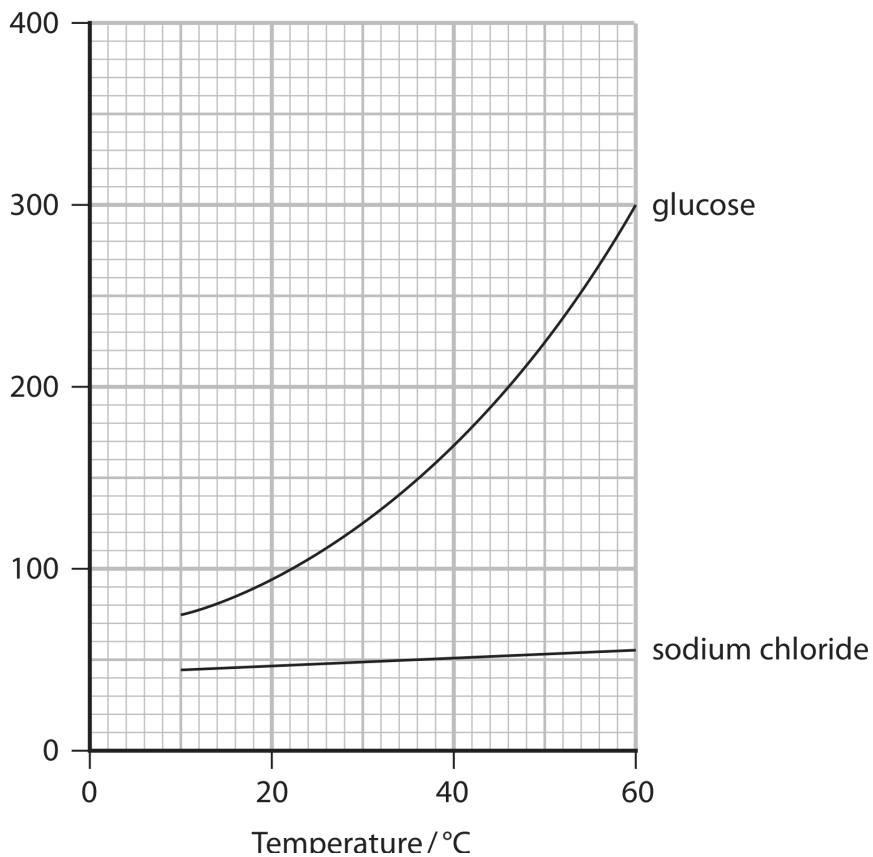
January 2020 · Unit 1 (WBI11) · Question 4 · Water, solubility & transport

● hard ● medium ● easy

● **4 (a)(i)**

Compare and contrast · [3 marks]

Compare and contrast the effect of temperature on the solubilities of sodium chloride and glucose in water.

● **4 (a)(ii)**

Calculate · [2 marks]

The formula mass of sodium chloride is 58.44. Calculate the molecular mass of glucose.

Element	Atomic mass
carbon	12
hydrogen	1
oxygen	16

● **4 (a)(iii)**

Calculate · [1 mark]

Calculate how many times greater the molecular mass of glucose is than the formula mass of sodium chloride.

● **4 (a)(iv)**

Suggest · [2 marks]

Suggest why there is a difference in the solubility of sodium chloride and glucose in water.

● **4 (b)**

Explain · [2 marks]

Explain why fatty acids are less soluble in blood than glucose and sodium chloride.

Edexcel IAL Biology - Solved Past Paper

June 2022 · Unit 1 (WBI11/01) · Question 1 · Water - dipole, solvent & hydrolysis

● hard ● medium ● easy

● 1

Complete · [5 marks]

Complete the description of water by writing the most appropriate word on each dotted line (five gaps).

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Edexcel IAL Biology - Solved Past Paper

January 2023 · Unit 1 (WBI11/01) · Question 1 · Water & carbohydrates

● hard ● medium ● easy

● 1 (a)

Draw · [2 marks]

Draw a diagram of a water molecule to show its dipole nature.

.....

.....

.....

● 1 (b)

Match · [3 marks]

Match each statement to the correct carbohydrate group (monosaccharides only / polysaccharides only / both / neither).

Statement	Carbohydrates			
	both monosaccharides and polysaccharides	monosaccharides only	polysaccharides only	neither monosaccharides nor polysaccharides
Have the general formula $C_nH_{2n}O_n$	☐	☐	☐	☐
Have glycosidic bonds	☐	☐	☐	☐
Have little effect on water potential	☐	☐	☐	☐

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Edexcel IAL Biology - Solved Past Paper

January 2024 · Unit 1 (WBI11/01) · Question 4 · Water - dipole, hydrogen bonding & solubility

● hard ● medium ● easy

● 4 (a)(i)

Explain · [2 marks]

Explain the dipole nature of water.

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● 4 (a)(ii)

Complete · [1 mark]

Complete the diagram to show a hydrogen bond between two water molecules.

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● 4 (b)

Complete · [1 mark]

Complete the diagram to show two water molecules arranged around a dissolved sodium ion (Na^+).

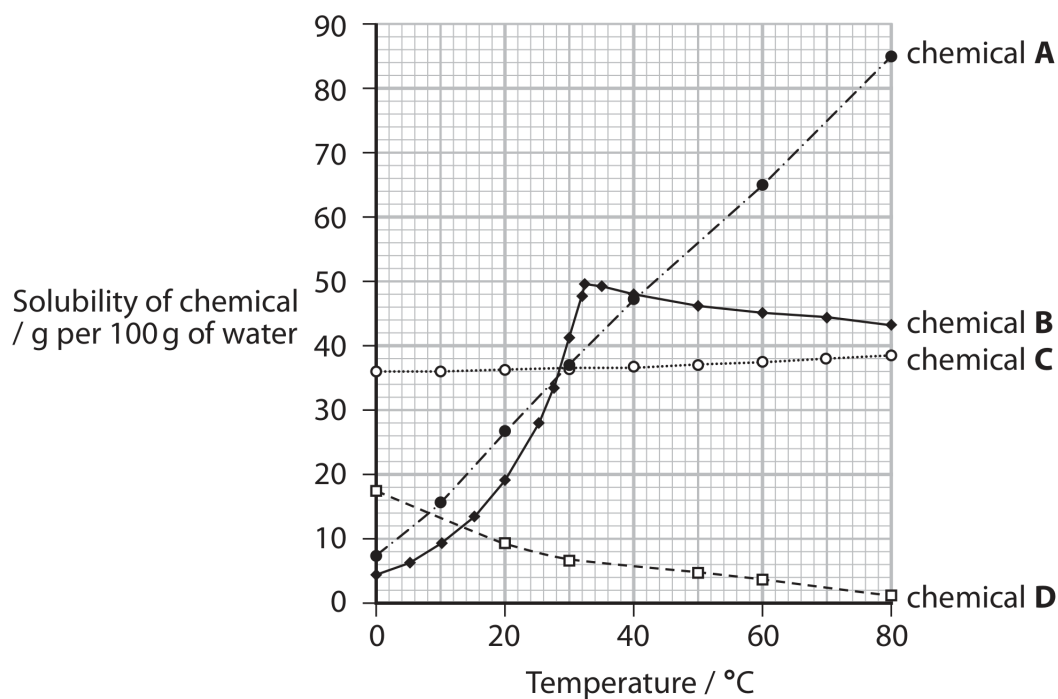
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● 4 (c)

Describe · [4 marks]

Describe the effects of temperature on the solubility of chemicals A, B, C and D.



Edexcel IAL Biology - Solved Past Paper

January 2025 · Unit 1 (WBI11/01) · Question 1 · Water, starch & peptide bonds

● hard ● medium ● easy

● 1 (a)

Which · [1 mark]

Which statements about water are correct? 1. an O joined to two H by hydrogen bonds; 2. water is a solvent; 3. the O is slightly negative and the H atoms slightly positive.

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

● 1 (b)

Match · [3 marks]

For each structure, say whether it is found in amylose only, amylopectin only, both, or neither.

Structure	Structure found in			
	amylose only	amylopectin only	both amylose and amylopectin	neither amylose nor amylopectin
glycosidic bonds	☐	☐	☐	☐
1-4 α bonds	☐	☐	☐	☐
branched side chains	☐	☐	☐	☐

● 1 (c)

Complete · [1 mark]

Complete the diagram to show a peptide bond joining the two amino acids.

Pearson Edexcel International Advanced Level

October 2025 · Unit 1: Molecules, Diet, Transport and Health (WBI11/01) · Question 5

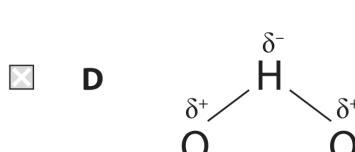
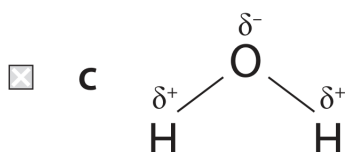
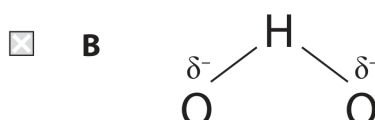
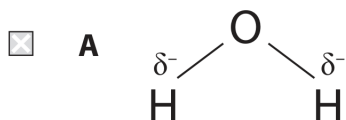
Water, solvents & osmosis

● hard ● medium ● easy

● (a)

Select · [1 mark]

Which is the structure of a water molecule?



● (b)

Calculate · [2 marks]

The volume of water on Earth is $1.4 \times 10^{12} \text{ km}^3$. Fresh water is 2.5% of this, and 90% of that fresh water is frozen (unavailable). Calculate the volume of available fresh water. Give your answer in standard form.

● (c)

Suggest · [1 mark]

The global demand for water is expected to rise to about 6 000 km^3 by 2050. Suggest one reason for an increase in the global demand for water.

● (d)

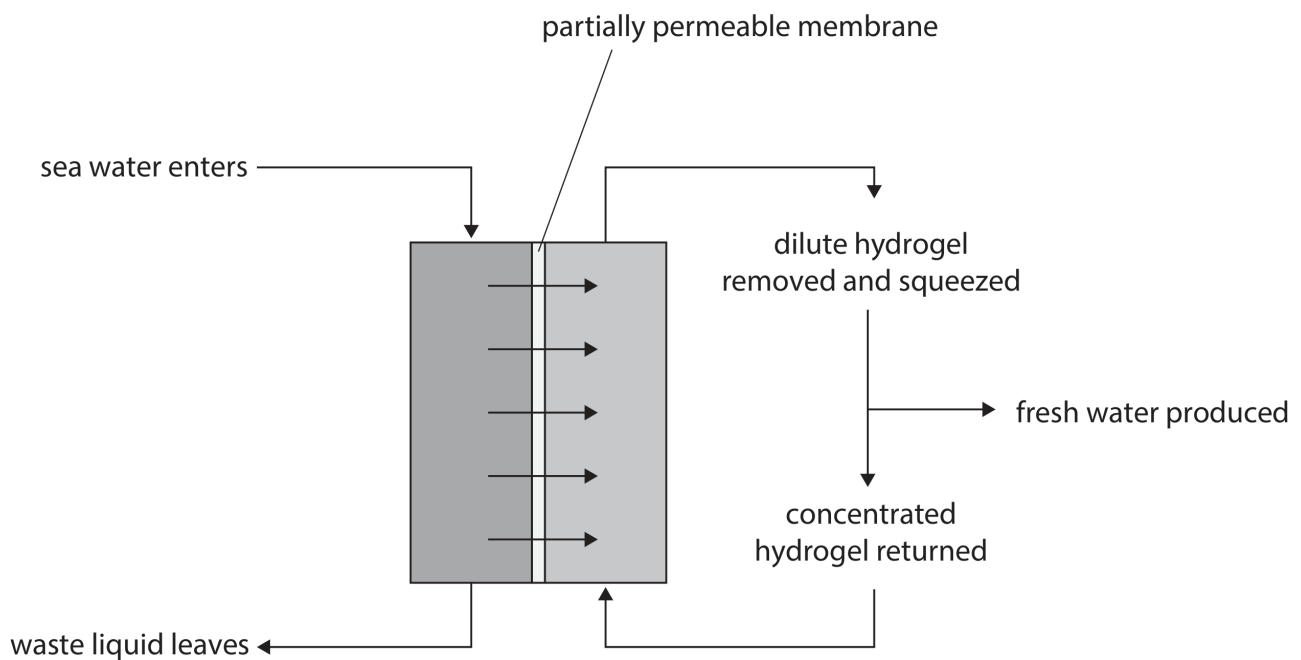
Explain · [2 marks]

Salt has positive sodium ions (Na^+) and negative chloride ions (Cl^-). Explain why salt can dissolve in water.

● (e)

Explain · [4 marks]

Hydrogels absorb water because they have a low water potential. The diagram shows forward osmosis desalination: sea water enters, dilute hydrogel is removed and squeezed to give fresh water, and the concentrated hydrogel is returned. Explain how forward osmosis desalination produces fresh water. Use the diagram.



Sugars & glycosidic bonds

Pearson Edexcel International Advanced Level

January 2019 · Unit 1: Molecules, Diet, Transport and Health (WBI11/01) · Question 1
Carbohydrates - mono-, di- and polysaccharides

● hard ● medium ● easy

● (a)(i)

Select · [1 mark]

Which formula is correct for a monosaccharide?



● (a)(ii)

Name · [1 mark]

Name the reaction that joins two monosaccharides together to form a disaccharide.

● (b)(i)

Select · [1 mark]

Which carbohydrate is present in cow's milk? A amylose B galactose C lactose D sucrose

● (b)(ii)

Select · [1 mark]

Which carbohydrate contains only glucose subunits? A amylopectin B galactose C maltose D sucrose

● (b)(iii)

Select · [1 mark]

Which carbohydrate is the energy store in animals? A amylose B fructose C glycogen D sucrose

● (b)(iv)

Select · [1 mark]

In which carbohydrate are 1-6 glycosidic bonds present? A amylose B amylopectin C fructose D maltose

Edexcel IAL Biology - Solved Past Paper

June 2019 · Unit 1 (WBI11/01) · Question 5 · Carbohydrates & osmotic dehydration

● hard ● medium ● easy

● 5 (a)(i)

Identify · [1 mark]

Which row shows which sugars are monosaccharides and which are disaccharides?

	Monosaccharides	Disaccharides
☐ A	fructose only	glucose and sucrose
☐ B	glucose only	fructose and sucrose
☐ C	fructose and glucose	sucrose only
☐ D	glucose and sucrose	fructose only

● 5 (a)(ii)

Identify · [1 mark]

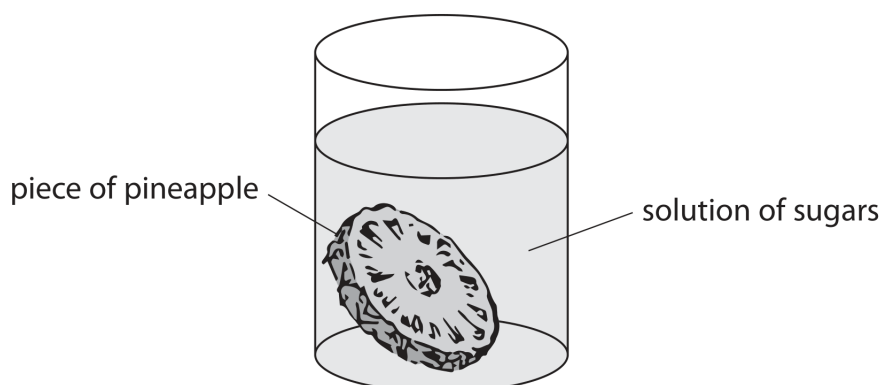
Which type of bond joins two monosaccharides to form a disaccharide?

- ☐ A ester
- ☐ B glycosidic
- ☐ C peptide
- ☐ D phosphodiester

● 5 (b)(i)

Calculate · [2 marks]

Calculate the mean concentration of glucose in the three pineapples. Give your answer in g dm^{-3} .



Explain · [6 marks]

Edexcel IAL Biology - Solved Past Paper

June 2023 · Unit 1 (WBI11/01) · Question 3 · Sucrose - glycosidic bond & a colorimetric test

● hard ● medium ● easy

● 3 (a)(i)

Complete · [1 mark]

Complete the diagram to show a glycosidic bond between carbon 1 of glucose and carbon 2 of fructose.

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● 3 (a)(ii)

Complete · [2 marks]

Complete the formula equation for the reaction that makes sucrose from glucose and fructose.

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● 3 (b)(i)

Explain · [1 mark]

Give a reason why the colour intensity is directly proportional to the concentration of sucrose.

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● 3 (b)(ii)

Suggest · [1 mark]

Suggest why the line does not start at the origin of the graph.

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● 3 (b)(iii)

State · [1 mark]

State why the concentration of maltose and lactose cannot be measured using this test.

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Edexcel IAL Biology - Solved Past Paper

June 2024 · Unit 1 (WBI11/01) · Question 6 · Carbohydrates - glycosidic bonds & digestion

● hard ● medium ● easy

● 6 (a)

Complete · [3 marks]

Complete the diagram to show how two glucose molecules join by a glycosidic bond to form two products.

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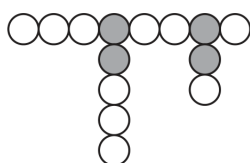
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● 6 (b)(i)

Draw · [2 marks]

Draw one disaccharide and two different oligosaccharides that could be produced by this amylase digesting amylopectin.



Key

- glucose molecule joined by 1–4 glycosidic bonds
- glucose molecule joined by 1–4 and 1–6 glycosidic bonds

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● 6 (b)(ii)

Explain · [2 marks]

Explain why this amylase is able to break only 1-4 glycosidic bonds.

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● 6 (c)(i)

Suggest · [3 marks]

Suggest how disaccharides and oligosaccharides are broken down in the small intestine. Give reasons.

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● **6 (c)(ii)**

Explain · [2 marks]

Explain why glucose cannot diffuse into the bloodstream.

Polysaccharides

Pearson Edexcel International Advanced Level

October 2019 · Unit 1: Molecules, Diet, Transport and Health (WBI11/01) · Question 4

Carbohydrates - sugars & starch

● hard ● medium ● easy● (a)(i)

Select · [1 mark]

The graph shows the relative sweetness of lactose, maltose, glucose, sucrose and fructose. Which row gives the correct number of monosaccharides and disaccharides shown?

	Number of monosaccharides	Number of disaccharides
☐ A	1	4
☐ B	2	3
☐ C	3	2
☐ D	4	1

● (a)(ii)

Select · [1 mark]

Which bond joins two monosaccharides together to form a disaccharide?

- ☐ A ester
- ☐ B glycosidic
- ☐ C hydrogen
- ☐ D phosphodiester

● (a)(iii)

State · [2 marks]

State two conclusions that can be made about the relative sweetness of monosaccharides and of disaccharides.

● (a)(iv)

Devise · [3 marks]

Devise an investigation that a student could carry out to confirm the data shown in the graph.

● (b)

Compare and contrast · [3 marks]

Amylose and amylopectin are components of starch. Compare and contrast the structure of amylose with the structure of amylopectin.

Edexcel IAL Biology - Solved Past Paper

January 2021 · Unit 1 (WBI11/01) · Question 3 · Glycogen, polysaccharides & inheritance

● hard ● medium ● easy

● 3 (a)(i)

Which · [1 mark]

Which is the correct statement about the formation of glycogen?

- ☐ A α glucose molecules join together by a condensation reaction
 - ☐ B α glucose molecules join together by a hydrolysis reaction
 - ☐ C β glucose molecules join together by a condensation reaction
 - ☐ D β glucose molecules join together by a hydrolysis reaction
-
-

● 3 (a)(ii)

Name · [1 mark]

Name the bond that joins two glucose molecules together.

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● 3 (a)(iii)

Explain · [3 marks]

Explain how the structure of glycogen relates to its role as an energy storage molecule.

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● 3 (b)(i)

Estimate · [2 marks]

GSD affects between 1 in 20 000 and 1 in 25 000 babies; ~25% of GSD patients have Von Gierke disease. 3.8 million babies are born per year. Estimate the number born each year with Von Gierke disease.

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● **3 (b)(ii)**

Suggest · [2 marks]

Von Gierke disease is inherited. Suggest why the majority of affected babies are born to parents who are not themselves affected.

Edexcel IAL Biology - Solved Past Paper

January 2022 · Unit 1 (WBI11/01) · Question 1 · Carbohydrates - starch & disaccharides

● hard ● medium ● easy

● 1 (a)

How many · [1 mark]

How many of these are correct for starch? · starch is a mixture of two polysaccharides · starch contains only 1-6 bonds · starch is insoluble in water

- ☐ A none
- ☐ B one
- ☐ C two
- ☐ D three

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● 1 (b)(i)

Complete · [4 marks]

Complete: monosaccharides are joined by a covalent bond. Sucrose and lactose both contain Sucrose also contains ; lactose also contains

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● 1 (b)(ii)

Name · [1 mark]

Name the type of reaction that joins two monosaccharides to form gentiobiose.

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● **1 (b)(iii)**

Which · [1 mark]

Each monosaccharide has molecular mass 180. Which is the molecular mass of gentiobiose (a disaccharide)?

- ☐ **A** 144
 - ☐ **B** 162
 - ☐ **C** 342
 - ☐ **D** 360
-
-
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Pearson Edexcel International Advanced Level

October 2023 · Unit 1: Molecules, Diet, Transport and Health (WBI11/01) · Question 6

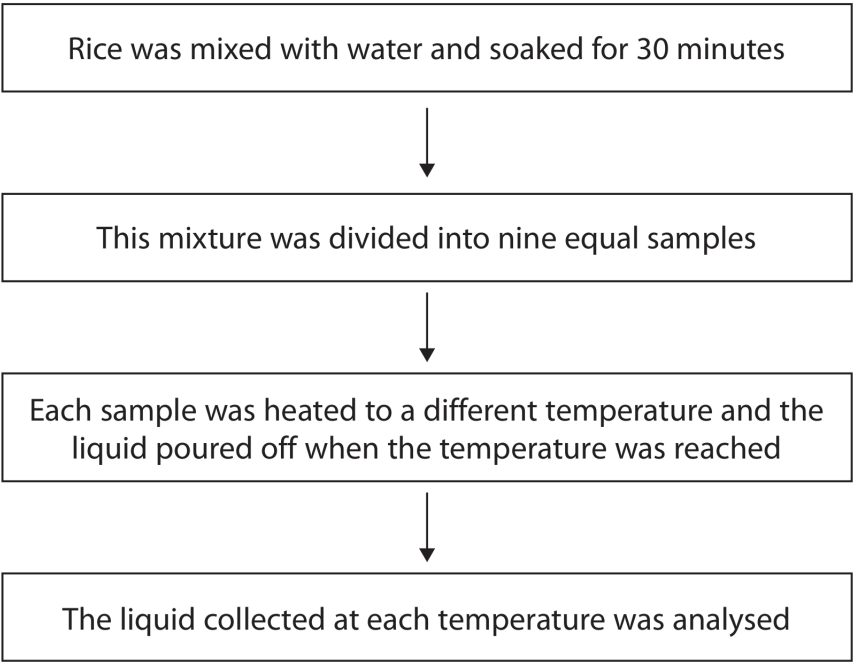
Starch - amylose & amylopectin

● hard ● medium ● easy

● (a) Complete · [3 marks]

Put one cross in each row to show whether the bond is found in amylose only, amylopectin only, both, or neither: glycosidic bonds; 1-6 alpha bonds; hydrogen bonds.

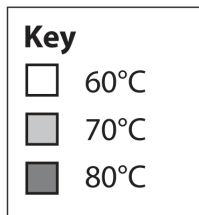
Types of bond	Bonds found in			
	amylose only	amylopectin only	both amylose and amylopectin	neither amylose nor amylopectin
glycosidic bonds	☐	☐	☐	☐
1-6 α bonds	☐	☐	☐	☐
hydrogen bonds	☐	☐	☐	☐



(b)

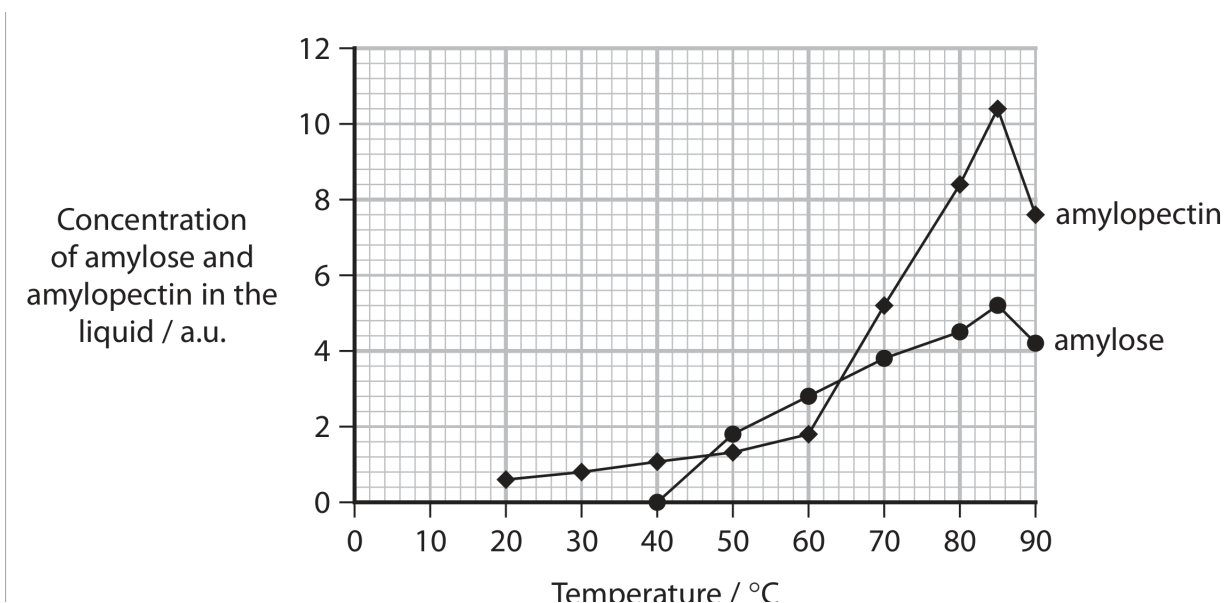
Describe · [2 marks]

The graph shows the percentage of amylose lost from four starch sources (potato, cassava, sweet potato, maize) at 60, 70 and 80 °C. Describe two conclusions about the effects of temperature and source of starch on amylose loss.

**(c)(i)**

Compare and contrast · [3 marks]

The graph shows the concentration of amylose and amylopectin in the liquid poured off rice at different temperatures. Compare and contrast the effects of temperature on the loss of amylose and amylopectin from rice.



● (c)(ii)

Comment on · [3 marks]

The table shows the hardness and stickiness of rice cooked in four replacement liquids (water; water + amylose; water + amylopectin; water + both). Comment on the effect of the replacement liquids on the hardness and stickiness of cooked rice. Use the table to support your answer.

Replacement liquid	Hardness of cooked rice / a.u.	Stickiness of cooked rice / a.u.
Water	19.42	1.19
Water containing amylose	27.63	1.21
Water containing amylopectin	20.43	1.71
Water containing both amylose and amylopectin	27.65	1.70

● (c)(iii)

Suggest · [2 marks]

Suggest why rice should be cooked in a measured volume of water, with the lid on, until all the cooking liquid has been absorbed. Use the table to support your answer.

Pearson Edexcel International Advanced Level

October 2025 · Unit 1: Molecules, Diet, Transport and Health (WBI11/01) · Question 6
Carbohydrates - structure, transport & storage

● hard ● medium ● easy

● (a)(i)

Select · [1 mark]

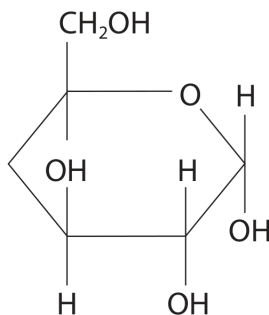
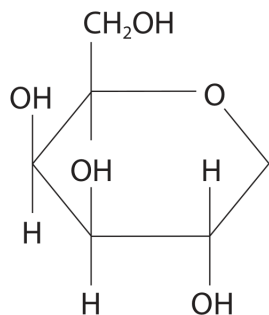
Which row shows a polysaccharide, a disaccharide and a monosaccharide?

	Polysaccharide	Disaccharide	Monosaccharide
☐ A	fructose	maltose	sucrose
☐ B	maltose	sucrose	fructose
☐ C	starch	maltose	sucrose
☐ D	starch	sucrose	fructose

● (a)(ii)

Complete · [2 marks]

Lactose is a disaccharide of galactose and glucose. Complete the diagram to show a molecule of lactose (from the two monosaccharide rings shown).



● (a)(iii)

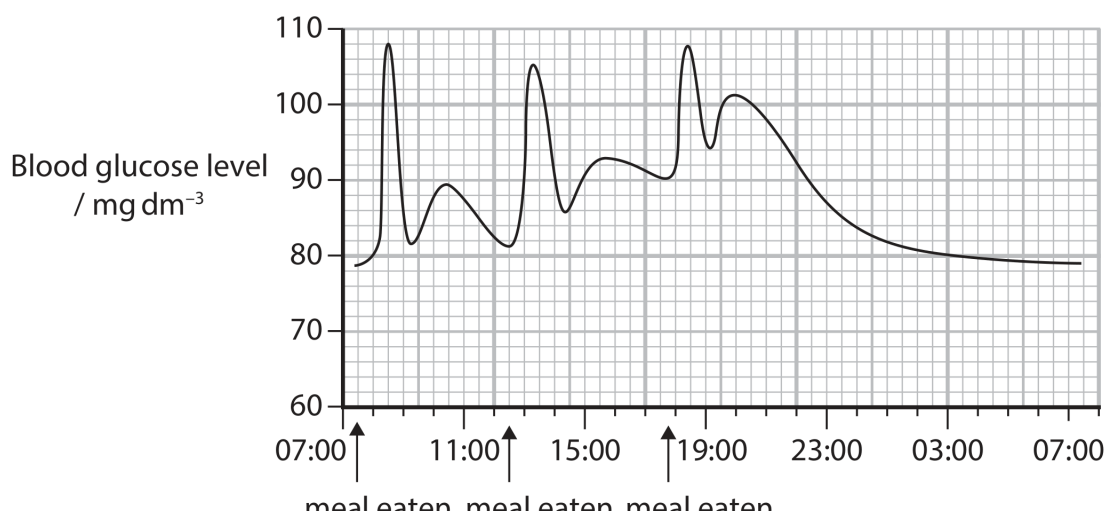
Describe · [2 marks]

Describe the structure of glycogen.

● (b)

Calculate · [2 marks]

The graph shows blood glucose level over a day. Calculate the maximum change in blood glucose level after the first meal is eaten. Give your answer to one significant figure with suitable units.



● (c)

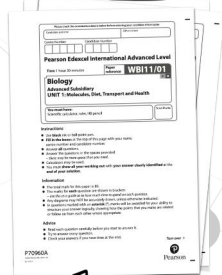
Explain · [6 marks]

*Explain how carbohydrates are metabolised, transported and used in the cells of the body, and stored in liver cells. Use the flowchart and your own knowledge of the structures, roles and properties of carbohydrates and transport mechanisms.

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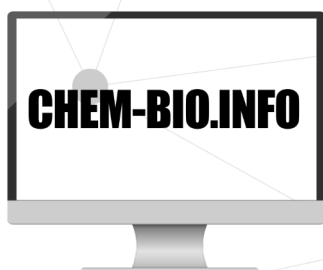
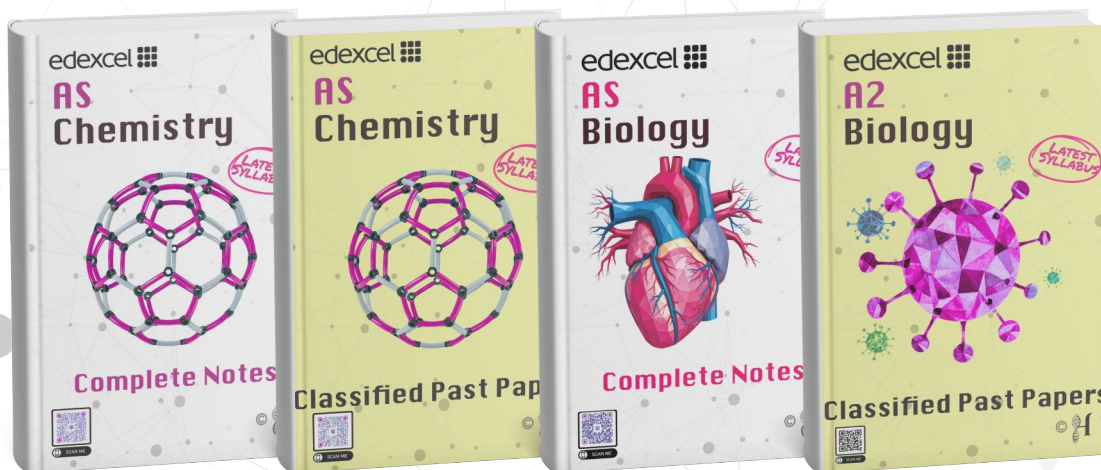


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