



Biology
Standard and Higher level
B1.1 Carbohydrates and lipids
Paper 2

22 August 2026

Zone A afternoon | **Zone B** morning | **Zone C** afternoon

Candidate name

2 hours

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Instructions to candidates

- Write your candidate name in the boxes above.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- This paper only includes short and long answer questions.
- Most of the questions are original and written by me. One question is taken/inspired from an external source, which is referenced.
- Although most questions focus on this topic only, some are linked to other topics. A few questions have intentionally similar answers to show you how questions can be phrased differently but ask about the same concept(s).
- The duration of this paper was scaled according to the number of marks available and based on how much time, on average, each mark is worth in examination settings. Since this is a practice paper, expect to need more time to complete it.
- **None of the questions are from IB past papers.**
- The maximum mark for this paper is **[65 marks]**.

Section A

1. Carbon is an important chemical element in living organisms.

(a) State how many bonds carbon can form with other atoms.

[1]

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(b) Explain how the chemical structure of carbon allows for the formation of diverse compounds

[3]

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2. The chemical structure of biomolecules explains their functions.

(a) State what an isomer is.

[1]

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(b) Outline **two** chemical properties that influence how glucose is used.

[2]

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(c) Explain how differences between glucose isomers lead to different biological properties.

[2]

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3. Large molecules are built from smaller molecules.

(a) Distinguish between how polymers are formed and broken.

[2]

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(b) Compare the structures of cellulose and starch.

[3]

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(c) Explain why plants use starch for energy storage.

[2]

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4. The chemical structure of biomolecules leads to physiological functions.

(a) Distinguish between glycoproteins and lipoproteins. [1]

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(b) Explain the role of glycoproteins in safe blood transfusions. [3]

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(c) Suggest **one** benefit of having different glycoproteins on the membranes of red blood cells within the human population. [1]

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5. Lipids are an important class of biomolecules.

(a) Outline the hydrophobic properties of lipids.

[3]

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(b) Fatty acids are lipids that contain polar bonds within their acidic region.
Explain why fatty acids are still considered hydrophobic.

[1]

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(c) Steroids are a class of lipids. Explain why steroid hormones do not require
receptors on the extracellular side of the cell membrane.

[2]

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6. Fatty acids have diverse structures.

(a) State what is meant by a polyunsaturated fatty acid.

[1]

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(b) Triglycerides contain fatty acids. Outline the role of triglycerides in animals. [2]

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(c) Explain how the number and configuration of carbon-carbon double bonds affects the physical properties of fatty acids.

[3]

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7. In the early stages of mammalian pregnancy, a developing embryo exchanges substances with its mother via cells in the lining of the uterus. At this stage, there is a high concentration of glycogen in cells lining the uterus.

(a) Describe the structure of glycogen. [3]

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(b) The glycogen in the cells lining the uterus is an important source of energy for the embryo. Outline how glycogen can act as a source of energy. [1]

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(c) State **one** other molecule used in the human body for energy storage. [1]

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Section B

There are not enough answer boxes for all the questions in this section in order to save on printing paper. You can use the few answer boxes for brainstorming your responses, and then record your answers on a separate sheet of paper.

8. Covalent bonding is the foundation of biomolecules.
- (a) Explain how α -glucose and β -glucose have identical chemical formulas but different properties. [3]
 - (b) Describe the changes in covalent bonding that occur during condensation to form triglycerides. [5]
 - (c) Carbohydrates and lipids both contain similar carbon bonds. Explain how different combinations of atoms lead to functional diversity. [7]
9. Molecular structures have consequences for organisms.
- (a) Describe the role of glycoproteins in cell-cell recognition. [3]
 - (b) Discuss, using an example, the link between the properties of a monosaccharide and how it is used in organisms. [5]
 - (c) Describe the role of polysaccharides in animals and plants. [7]



[illegible]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins or other markings on the paper.

References:

7. Physics and Math Tutor. <https://pmt.physicsandmathstutor.com/download/Biology/A-level/Topic-Qs/AQA/1-Biological-Molecules/Set-C/1.2%20Carbohydrates%20QP.pdf>

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