



Biology
Standard and Higher level
B1.2 Proteins
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.
- All of the questions are original and written by me.
- 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 **[60 marks]**.

Section A

1. Amino acids are an important class of biomolecules.

(a) State what an alpha carbon is.

[1]

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(b) Outline the basic structure of an amino acid.

[2]

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(c) Describe how two amino acids can become covalently linked.

[2]

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2. Amino acids are an important part of human diet.

(a) Distinguish between essential and non-essential amino acids.

[1]

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(b) Outline why the intake of essential amino acids requires attention in some diets.

[2]

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3. Amino acids are the building blocks of proteins.

(a) Define proteome.

[1]

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(b) Outline why there is virtually an infinite variety of amino acid sequences.

[2]

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(c) Describe the relationship between the genome and proteome.

[2]

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4. During an infection, patients can develop a fever.

(a) State the term used when a protein loses its three-dimensional structure. [1]

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(b) Explain how higher body temperatures can alter protein structure. [2]

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(c) Some pathogens can alter the pH inside of cells. Predict, with a reason, the effect of this on cellular proteins. [2]

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5. **[AHL]** There is variation in protein form and function.

(a) Outline the basis for the immense diversity of protein form and function. [2]

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(b) Explain the role of the amino acid sequence in protein folding. [2]

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(c) Describe the effect of polar and non-polar amino acids on the tertiary structure of globular proteins. [2]

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6. [AHL] Proteins have diverse structures.

(a) Distinguish between conjugated and non-conjugated proteins.

[1]

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(b) Outline the structure of **two** non-conjugated proteins.

[2]

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(c) Describe the structure of **one** conjugated protein.

[2]

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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.

7. **[AHL]** Protein folding occurs at multiple levels.

- (a) Explain the role of hydrogen bonding in secondary protein structures. [4]
- (b) Describe the tertiary structure of proteins. [4]
- (c) Explain how changes in temperature and pH can affect protein folding at the secondary, tertiary, and quaternary levels. [7]

8. **[AHL]** Proteins are diverse in form and function.

- (a) Outline the role of cryogenic electron microscopy in studying proteins. [3]
- (b) Explain how a mutation in one of the protein subunits in an antibody can affect the immune system. [5]
- (c) Discuss the role of amino and carboxyl groups in proteins. [7]



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