

## 2.3 Proteins

### Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	2. Biological Molecules
Topic	2.3 Proteins
Difficulty	Easy

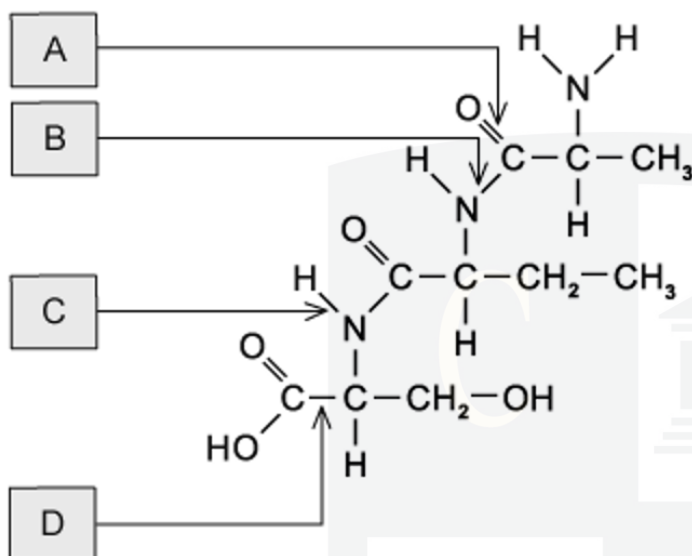
**Time allowed:** 10

**Score:** /10

**Percentage:** /100

### Question 1

The diagram shows a biological molecule found in cells.  
Which arrow labels a peptide bond?



[1 mark]

### Question 2

The tertiary structure of a protein molecule is maintained by which bonds?

	peptide	hydrogen	disulfide	ionic
A	X	✓	X	✓
B	✓	✓	X	X
C	X	✓	✓	✓
D	✓	X	✓	X

[1 mark]

### Question 3

The protein myoglobin has a similar function to haemoglobin except myoglobin does not have a quaternary structure.

Why does myoglobin not have a quaternary structure?

- A** Myoglobin has only one polypeptide chain.
- B** Myoglobin has a fibrous rather than a globular structure.
- C** Myoglobin does not contain a haem group.
- D** Myoglobin does not contain any alpha helices.

[1 mark]

### Question 4

Which of the following statements about fibrous proteins is incorrect?

- A** They are very sensitive to changes in heat
- B** They are insoluble.
- C** They are used as structural proteins.
- D** They often form long coils.

[1 mark]

### Question 5

How can the quaternary structure of haemoglobin be described?

- 1 a specific order of amino acids
- 2 a globular structure
- 3 an  $\alpha$ -helix
- 4 a dipeptide
- 5 four polypeptide chains connected together

**A** 5 only      **B** 2, 3 and 5      **C** 1, 2 and 3      **D** 2 and 5

[1 mark]

### Question 6

Which description of collagen is correct?

- A** Three collagen fibres coil around each other to form a strong, insoluble structure termed a triple helix.
- B** Both amino acids of the same polypeptide and amino acids of different polypeptides are joined by peptide bonds.
- C** The smallest amino acid, glycine, is found in a high proportion in collagen.
- D** Collagen polypeptides consist of many alpha helices in a regular spiral arrangement.

[1 mark]

### Question 7

Protein X is a transport protein found dissolved in blood plasma and is used to transport different things around the body. It contains six internal disulfide bridges and has a roughly spherical shape.

Protein Y is a structural protein found in the hair and nails of mammals. It is made of two alpha-helices twisted round each other to make a coiled coil.

Are albumin and keratin examples of globular or fibrous proteins?

- A** Both are globular proteins
- B** Both are fibrous proteins
- C** X is globular, Y is fibrous
- D** Y is globular, X is fibrous

[1 mark]

### Question 8

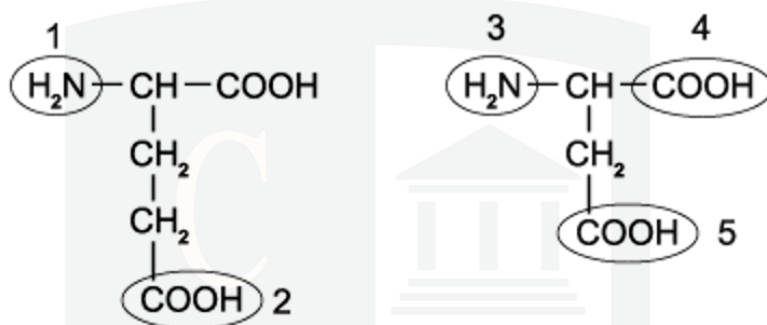
In protein molecules, which bonds are responsible for producing the primary, secondary and tertiary structure?

	level of structure		
	primary	secondary	tertiary
<b>A</b>	covalent	ionic	ionic
<b>B</b>	ionic	hydrogen	covalent
<b>C</b>	peptide	hydrogen	disulfide
<b>D</b>	covalent	ionic	hydrogen

[1 mark]

### Question 9

Two amino acids, both containing two carboxylic acid (-COOH) groups are illustrated below.



Which labelled groups take part in the formation of a dipeptide of these amino acids?

- A** 1 and 5      **B** 2 and 3      **C** 2 and 4      **D** 1 and 4

[1 mark]

### Question 10

The protein haemoglobin contains iron.

What is the role of iron within the molecule?

- A** It undergoes reduction and oxidation (redox) reactions  
**B** It stabilizes the quaternary structure of haemoglobin  
**C** It enables haemoglobin to dissolve in red blood cells  
**D** It binds oxygen to haemoglobin

[1 mark]

