

Proteins - Questions by Topic

Q1.

Muscle cells contain globular and fibrous proteins.

Compare and contrast the molecular structures of globular and fibrous proteins.

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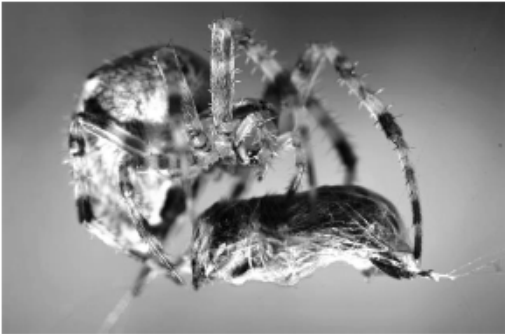
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(Total for question = 4 marks)

Q2.

Spiders inject a mixture of digestive enzymes into the body of their prey and feed on the products of this digestion.

The photograph shows a spider with its prey.



State why enzymes are described as biological catalysts.

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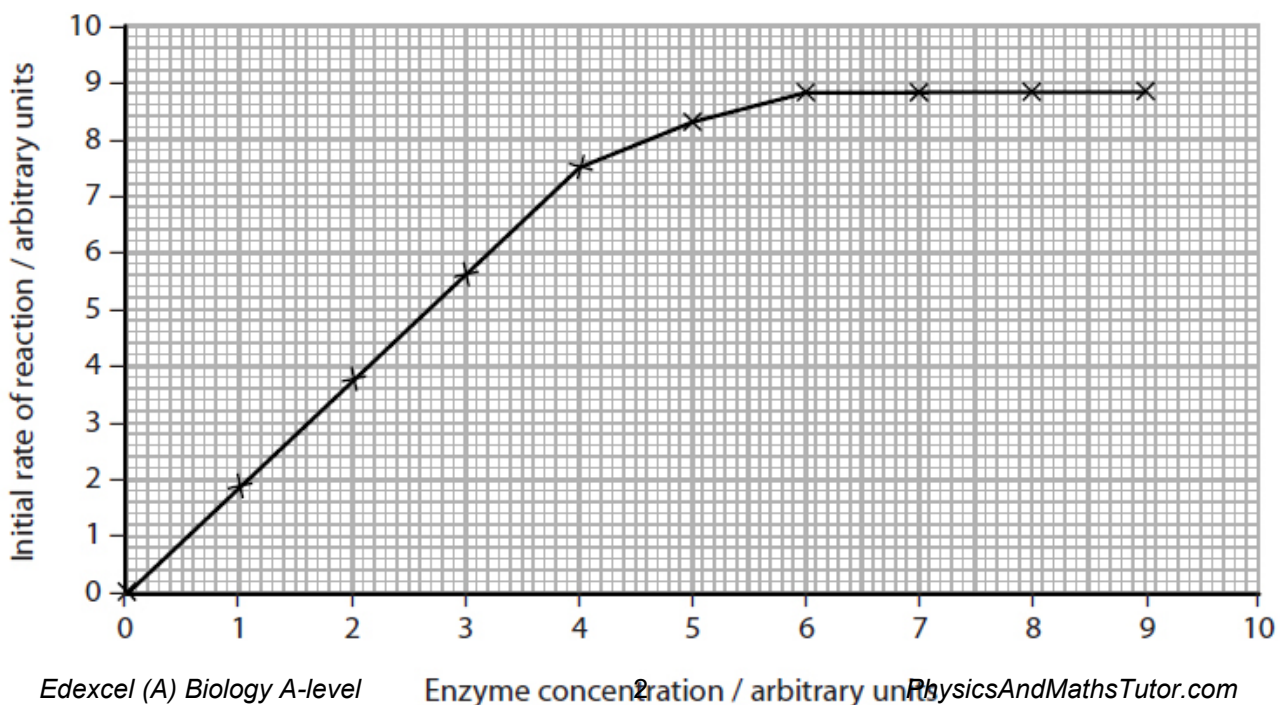
(Total for question = 1 mark)

Q3. Enzymes are biological catalysts made of protein.

(a) Proteins are chains of amino acids. In the space below draw the structure of **one** amino acid.

(3)

(b) The graph below shows the effect of changing the enzyme concentration on the initial rate of a reaction.



(i) Explain the effect of changing enzyme concentration on the initial rate of reaction.

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(ii) Describe an experiment that could be carried out to investigate the effect of enzyme concentration on the initial rate of reaction.

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Q4.

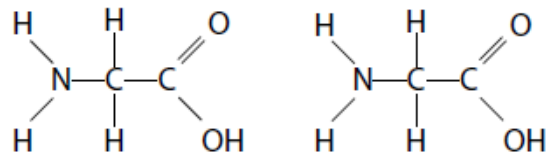
Proteins, such as collagen, are made from amino acids joined together.

(i) Which of the following is the name of the bond used to join amino acids together?

(1)

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

(ii) This diagram shows the structure of two amino acids that can be joined together by a reaction.



Draw a diagram to show the products of this reaction.

(2)

(iii) Which of the following is the R group in these amino acids?

(1)

- A COOH
- B NH₂
- C H
- D OH

(Total for question = 4 marks)

Q5.

Lysozyme is an enzyme found in tears. Lysozyme can destroy some bacteria by breaking down the polysaccharide chains that form part of their cell walls.

The primary structure of lysozyme is a specific sequence of 129 amino acids.

Two of the amino acids that make up the active site are in positions 35 and 52 in the primary structure.

Suggest how these two amino acids could be brought closer together to form part of the active site of this enzyme.

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Q6.

Lysozyme is an enzyme found in tears. Lysozyme can destroy some bacteria by breaking down the polysaccharide chains that form part of their cell walls.

Temperature affects the activity of lysozyme.

Suggest why increasing the temperature above 45 °C causes a decrease in the activity of lysozyme.

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Q7.

Haemophilia is a disease that affects blood clotting. People with haemophilia are sometimes given a protein called factor VIII. Factor VIII is an enzyme that is involved in the process of blood clotting.

Explain how a change in the primary structure of factor VIII could cause difficulties with blood clotting.

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(Total for question = 4 marks)

Q8.

Some species of bacteria have developed resistance to antibiotics.

This has led scientists to investigate many molecules for antimicrobial properties.

Peptides extracted from broad bean plants and cowpea plants have been studied.

Describe how a peptide bond is formed.

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(Total for question = 2 marks)