Biological Molecules, Food Tests and Enzymes: Test Pack

Total Marks

EDEXCEL 4BI1 · Calculator allowed · about 20 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which of these molecules is made by joining many glucose molecules together?

- ☐ A glycogen
- ☐ B protein
- ☐ C triglyceride
- ☐ D fatty acid

(Total for Question 1 is 1 mark)

2 A student tests a sample of potato for starch. Describe the test the student should use and the results that show starch is present and absent.

(Total for Question 2 is 3 marks)

3 Enzymes are biological catalysts. Explain what is meant by this statement and state what type of molecule an enzyme is.

(Total for Question 3 is 3 marks)

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4 A human enzyme works best at 37 degrees C. Describe and explain what happens to its activity as the temperature is raised from 10 degrees C to 70 degrees C.

(Total for Question 4 is 4 marks)

5 Enzymes are proteins. Describe how a protein is made, and explain why an enzyme stops working when it is heated well above its optimum temperature.

(Total for Question 5 is 5 marks)

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Mark scheme · Biological Molecules, Food Tests and Enzymes: Test Pack

Question 1

A (glycogen) **B1**

Answer: A

Question 2

add iodine solution to the sample (accept drops of iodine solution) **B1**

starch present: colour changes from orange-brown to blue-black **B1**

starch absent: iodine stays orange-brown (accept yellow-brown) **B1**

Answer: Add iodine solution. Blue-black means starch is present; it stays orange-brown if starch is absent.

Question 3

a catalyst speeds up (increases the rate of) a chemical reaction **B1**

and is not used up (or changed) in the reaction **B1**

enzymes are proteins (accept: made by living cells) **B1**

Answer: A catalyst speeds up a reaction without being used up; enzymes are proteins made by living organisms.

Question 4

as temperature rises towards the optimum, activity increases **B1**

because molecules move faster and collide more often, so more enzyme-substrate complexes form per second (accept more kinetic energy) **B1**

above the optimum activity falls, and at a high temperature it stops **B1**

because the enzyme is denatured: its active site changes shape so the substrate no longer fits **B1**

Answer: Activity rises to a maximum near 37 degrees C because of more frequent collisions, then falls as the enzyme is denatured and the active site changes shape.

Question 5

a protein is a long chain made of many amino acids joined together **B1**

the sequence (order) of the amino acids decides how the chain folds **B1**

the chain folds into a specific three-dimensional shape that forms the active site **B1**

a high temperature breaks bonds holding the shape, so the shape (and the active site) changes **B1**

the substrate no longer fits, so the enzyme is denatured and cannot catalyse the reaction **B1**

Answer: Amino acids are joined in a chain; their order decides the fold and the shape of the active site. Heat breaks the bonds, changes the shape, the substrate no longer fits and the enzyme is denatured.

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