

3.1 Mode of Action of Enzymes

Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	3. Enzymes
Topic	3.1 Mode of Action of Enzymes
Difficulty	Easy

Time allowed: 10

Score: /10

Percentage: /100

Question 1

Which statements are true about the optimum temperature of all enzymes?

- 1 It is equal to human body temperature (36.5 – 37.5°C)
- 2 Enzyme/substrate complexes are formed at the quickest rate.
- 3 It is the maximum temperature an enzyme will function.
- 4 Increasing temperature past the optimum will break bonds in the tertiary structure.

- A** 1, 2 and 3 only
- B** 3 and 4 only
- C** 2, 3 and 4 only
- D** 2 and 4 only

[1 mark]

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Question 2

The following statements are about enzymes:

- 1 The speed they function at can be reduced by competitive inhibitors.
- 2 Their primary structure is translated from mRNA.
- 3 They can be embedded in the plasma membrane of a cell.
- 4 They have tertiary and quaternary structures.

Which statements are correct for all enzymes?

- A 1 and 3 only
- B 1, 2 and 3 only
- C 2, 3 and 4 only
- D All correct

[1 mark]

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Question 3

Enzymes function optimally in detergents at temperatures between 20 and 60°C and within a pH range of 7–10.5. The most widely used detergent enzymes efficiently break down protein, carbohydrate and fat stains.

If a washing cycle is set to run at 40°C and pH 8, which row best describes what is happening

	protease	carbohydrase	lipase
A	condensation of peptide bonds	condensation of glycosidic bonds	condensation of ester bonds
B	condensation of peptide bonds	hydrolysis of peptide bonds	hydrolysis of ester bonds
C	hydrolysis of peptide bonds	hydrolysis of glycosidic bonds	hydrolysis of ester bonds
D	condensation of glycosidic bonds	hydrolysis of ester bonds	hydrolysis of peptide bonds

[1 mark]

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Question 4

Which of the statements below correctly describe the roles of enzymes?

- 1 They catalyse the building of larger molecules from smaller molecules.
- 2 They cause more frequent collisions between molecules.
- 3 They lower the activation energy required to start a reaction.
- 4 They are translated from mRNA by a ribosome.

- A** All 4 statements
- B** 1, 2 and 3 only
- C** 2, 3 and 4 only
- D** 1, 3 and 4 only

[1 mark]

Question 5

Which levels of protein structure determine the specificity of an enzyme?

- 1 Primary
- 2 Secondary
- 3 Tertiary
- 4 Quaternary

- A** 1, 2 and 3 only
- B** 3 and 4 only
- C** 2, 3 and 4 only
- D** All 4 statements

[1 mark]

Question 6

Which of the following statements is true of all enzymes?

- A** They are soluble in water.
- B** They have a quaternary structure.
- C** They have only one active site.
- D** They catalyse anabolic reactions.

[1 mark]

Question 7

Washing powder contains various enzymes to remove stains efficiently from clothing

Which of the following would be the most important for removing a butter stain from a shirt?

- A** proteases
- B** lipases
- C** carbohydrases
- D** cellulase

[1 mark]

Question 8

During the production of fruit juice, the enzyme pectinase is used to break down pectin, a polysaccharide commonly found in the cell walls of plant cells. This releases more juice.

What product would be formed by the hydrolysis of the cell walls?

- A α -glucose
- B cellulose
- C starch
- D β -glucose

[1 mark]

Question 9

Catalase was added to a large amount of hydrogen peroxide solution. The volume of oxygen produced in the first five seconds was measured to be 250 cm³

What is the initial rate of reaction in dm³ min⁻¹?

- A 50 dm³min⁻¹
- B 3 dm³min⁻¹
- C 0.05 dm³min⁻¹
- D 3000 dm³min⁻¹

[1 mark]

Question 10

What best describes the effect of an enzyme in an enzyme-catalysed reaction?

- A** Increases activation energy and has no effect on the energy yield.
- B** Increase activation energy and decreases the energy yield.
- C** Decreases activation energy and has no effect on the energy yield.
- D** Decreases activation energy and increase the energy yield.

[1 mark]

