



Biology Leaving Certificate Higher Level

Past Exam Questions on:

Enzymes

Q 9 2013

(iv) When investigating digestive activity during seed germination:

1. How did you supply a substrate suitable for the digestive enzymes?

2. How did you ensure that no digestive enzymes were available on the control plate?

Q9 2012

9. (a) Answer the following in relation to enzymes.

(i) What is their chemical nature? _____

(ii) Comment upon their molecular shape. _____

(b) Answer the following in relation to an investigation that you carried out into the effect of temperature on the rate of enzyme action.

(i) Name the enzyme that you used.

(ii) Name the substrate of this enzyme.

(iii) Why was it necessary to keep the pH constant in the course of the investigation?

(iv) How did you keep the pH constant?

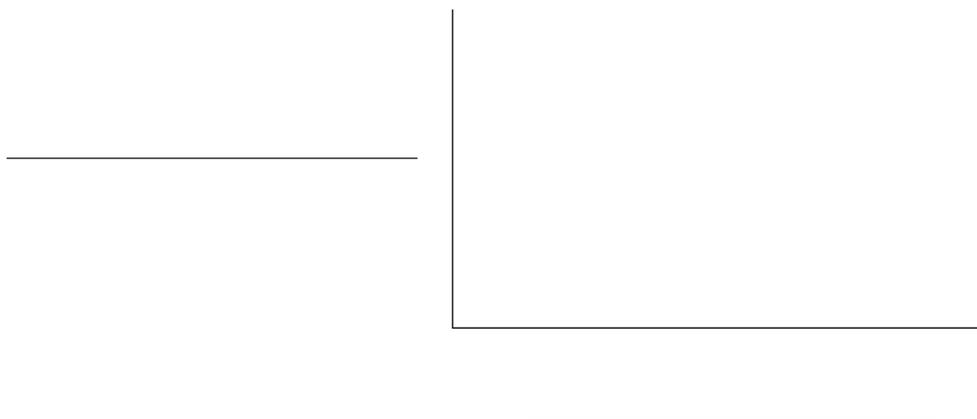
(v) How did you vary the temperature in the course of the investigation?

(vi) How did you know that the enzyme was working?

(vii) Use the axes below to summarise the results of your investigation.

Do this by

1. labelling the axes,
2. drawing a graph to show how the rate of enzyme action varied with temperature.



Q14 2011

- (b) (i) What is meant by the term *metabolism*?
- (ii) "Enzymes are essential for metabolism".
Explain why this statement is true.
- (iii) In **each** of the following cases state whether the process is anabolic or catabolic.
1. Protein synthesis.
 2. Conversion of ADP to ATP.
 3. Reactions in which product molecules are larger than substrate molecules.
- (iv) State **one** way by which an enzyme may be denatured.
- (v) Give **two** features of a denatured enzyme.
- (vi) Apart from carbon, hydrogen and oxygen, there is one other element always present in the building blocks of enzymes. Name that element.

Q14 2010

- (b) (i) What is an enzyme?
- (ii) What is meant by the *specificity* of an enzyme?
- (iii) Explain how the Active Site Theory may be used to explain the specificity of enzymes.
- (iv) Bioprocessing often involves the use of immobilised enzymes in a bioreactor.
1. What does the term *immobilisation* refer to when used about enzymes?
 2. Explain the term *bioreactor*.
- (v) Give **one** example of the use of immobilised enzymes in bioreactors.
In your answer name the enzyme, the substrate and the product.

9. (a) (i) To which group of biomolecules do enzymes belong? _____
(ii) Name a factor that influences the activity of an enzyme.

(b) In the course of your practical investigations you prepared an enzyme immobilisation. Answer the following questions in relation to that investigation.

- (i) Describe how you carried out the immobilisation.

(ii) In the space provided draw a labelled diagram of the apparatus that you used to investigate **the activity** of the immobilised enzyme.

- (iii) Briefly outline how you used the apparatus referred to in (b) (ii) above.

Q 9 2008

Q9 (a)

What is meant by an enzyme's optimum pH?

What is a *denatured enzyme*?

(b) In the course of your studies you investigated the effect of denaturation by heat application on the activity of an enzyme.

(i) Name the enzyme that you used

(ii) What substrate did you use?

(iii) Describe how you carried out the investigation. In your answer you must refer to the way that you measured the enzyme's activity

(iv) State the results that you obtained.

Q7 2007

7. (a) What is meant by an enzyme?

Give an example of a protein that has a **structural** role.

(b) Answer the following questions in relation to an investigation that you carried out to determine the effect of temperature on enzyme action.

(i) Name the enzyme that you used.

(ii) Name the substrate of the enzyme.

(iii) State one factor that you kept constant during the investigation.....

(iv) How did you keep this factor constant?

(v) How did you vary the temperature?

(vi) How did you measure the rate of activity of the enzyme?

(v) What was the result of your investigation?

Q 11(c) 2007

Enzymes can be immobilised and then used in bioprocessing.

(i) What is meant by immobilisation?

(ii) Name a substance that is used to immobilise enzymes.

(iii) Give **two** advantages of using immobilised enzymes.

(iv) Give **one** application of a named immobilised enzyme. In your answer, refer to substrate, enzyme and product.

(24)

Q3 2006

The graph shows how the rate of reaction of a carbohydrate-digesting enzyme in the human alimentary canal varies with pH.

- (a) Name a carbohydrate-digesting enzyme in the human alimentary canal
- (b) Where in the alimentary canal does this enzyme act?
- (c) State the enzyme's product (s)
- (d) What is the pH at A?
- (e) A is said to be the enzyme's pH
- (f) Suggest a temperature at which human enzymes work best
- (g) What term best describes the shape of an enzyme?

Q7 2005

- . (a) Immobilised enzymes are sometimes used in bioreactors.
 - (i) What is a bioreactor?
 - (ii) State **one** advantage of using an immobilised enzyme in a bioreactor.

- (b) Answer the following questions in relation to an experiment that you carried out to immobilise an enzyme and use that immobilised enzyme.
 - (i) Name the enzyme that you used
 - (iii) Draw a labelled diagram of the apparatus that you used to immobilise the enzyme.
 - (iv) Describe how you used this apparatus to immobilise the enzyme. In your answer name the solutions that you used and explain their purpose.
 - (v) Describe briefly how you used the immobilised enzyme.

