Biology
Leaving Certificate
Ordinary Level

Past Exam Questions on
Biochemical Reactions and Enzymes

Q5 Section A 2013

5. Choose each term from the following list and place it in **Column B** to match a description in **Column A**. The first one has been completed as an example.

List: ~~**Amylase;**~~ **Temperature; Substrate; Immobilised; Reusable; Protein.**

Column A	Column B
An example of an enzyme.	**Amylase**
(a) The group of biomolecules to which enzymes belong.	
(b) Enzyme activity is affected by this.	
(c) Enzymes trapped in an inactive material.	
(d) The substance with which an enzyme reacts.	
(e) Advantage of using immobilised enzymes.	

Q8 Section B 2012

8. (a) (i) What is an enzyme? _____

(ii) On what structures in the cytoplasm are enzymes made? _____

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

(i) What enzyme did you use? _____

(ii) What substrate did you use? _____

(iii) How did you vary the temperature during the investigation? _____

_____

_____

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

_____

_____

(v) During this investigation pH was kept constant. How did you keep the pH constant?

_____

_____

(vi) What was the result of your investigation?

_____

_____

_____

Q12 Part (c) Section C 2011

(c) Enzymes are used in many processes in both plants and animals.

(i) What is an enzyme?
(ii) Name any **one** enzyme, **and** its substrate, **and** its product.
(iii) The rate of activity of enzymes can be affected by various factors.
Name any **two** factors that can affect enzyme activity.
(iv) Enzymes are sometimes immobilised in industrial processes.
What is meant by the term *immobilised* in relation to enzymes?
(v) Give **one** advantage of using immobilised enzymes. **(27)**

Q8 Section B 2010

8. (a) (i) What is an enzyme? _____

(ii) Explain what is meant by the term *pH*. _____

_____

(b) Answer the following questions in relation to your investigation into the effect of pH on the rate of enzyme activity.

(i) Name the enzyme you used in this investigation. _____

(ii) Name

1. The substrate of this enzyme. _____

2. The product of this enzyme. _____

(iii) Draw a labelled diagram of the apparatus you used in your investigation.

(iv) How did you vary the pH? _____

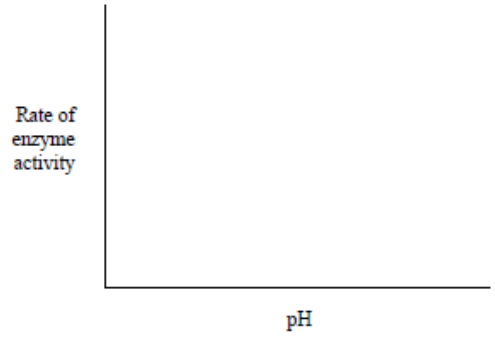
_____

(v) Name **one** factor you kept constant. _____

(vi) How did you keep the named factor constant? _____

_____

(vii) Draw a graph, on the axes given below, to show the results of this investigation.



Q12 Part (a) and (b) Section C 2010

12. (a) (i) What is meant by *metabolism*?

(ii) Give **two** reasons why living things need energy. (9)

(b) (i) Which biological process is represented by the following word equation:

glucose + oxygen → carbon dioxide + water + energy?

(ii) The above process occurs in two stages, Stage 1 and Stage 2, that take place in different parts of the cell.

Say where in the cell Stage 1 occurs **and** where in the cell Stage 2 occurs.

(iii) Does the whole process release a large amount or a small amount of energy?

(iv) Write a word equation to show what happens when **yeast** breaks down glucose in the absence of oxygen.

(v) Give **one** industrial application of this process.

(vi) When **muscle**s break down glucose in the absence of oxygen, one main product is produced. Name this product. (27)

Q15 Section C 2009

15. Answer any **two** of (a), (b) and (c) **(30, 30)**

(a)
(i) Write the balanced equation for photosynthesis.
(ii) What is the main source of light for photosynthesis?
(iii) During photosynthesis water molecules are split into **three** products. Name **each** of these products.
(iv) Describe what happens to **each** of the products referred to in (iii).
(v) Name the structures in which photosynthesis occurs in plant cells.

(b)
(i) What is meant by the term *aerobic respiration*?
(ii) Aerobic respiration takes place in two main stages – stage 1 and stage 2. Indicate clearly **in your answer book** whether each of the following statements refers to stage 1 or to stage 2.
A. Takes place in the mitochondria.
B. Produces a large amount of energy.
C. Takes place in the cytoplasm.
D. Does not require oxygen.
(iii) One of your practical activities was to prepare alcohol using yeast. **In your answer book** answer the following questions in relation to this activity:
A. Name the solution in which you placed the yeast at the start of the activity.
B. Give the temperature at which you then kept the solution.
C. How did you know that alcohol production had ceased?
D. Name the test **or** chemical(s) used to show that alcohol had been produced.

(c)
(i) To what group of biomolecules do enzymes belong?
(ii) Name the small molecules which are the building blocks for these biomolecules.
(iii) The action of the enzyme amylase on its substrate starch is an example of a catabolic reaction. Explain **each** of the underlined terms.
(iv) What is meant by immobilisation of an enzyme?
(v) Describe how you immobilised an enzyme in the course of your practical work.
(vi) Give **one** advantage of bioprocessing using an immobilised enzyme.
(vii) Suggest **one** reason why enzymes are not found in body soap or shampoo.

Q2 Section A 2008

2. Choose a term from the following list and place it in **Column B** to match the description in **Column A**. The first one has been completed as an example:

amino acid, nitrogen, haemoglobin, keratin, enzyme

Column A	Column B
A protein present in blood	**haemoglobin**
An element always present in proteins along with C, H, O	
A protein which changes reaction rates	
The end product of protein digestion	
A structural protein	

Q7 Section B 2007

7. **(a)** (i) Is an enzyme a lipid, a protein or a carbohydrate? .....

(ii) Where in a cell are enzymes produced? .....

(b) As part of your practical activities you investigated the effect of temperature on the rate of activity of an enzyme.

(i) Name the enzyme that you used .....

(ii) Name the substrate with which the enzyme reacts .....

(iii) How did you vary the temperature? .....

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.....

.....

(iv) How did you keep a constant pH during the investigation?

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

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(vi) What was the result of your investigation?

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Q13 Section C 2006

13. (a) (i) Identify X and Y in the following equation which is a summary of aerobic respiration.

$C_6H_{12}O_6 + 6X \longrightarrow 6Y + 6H_20$

(ii) What is anaerobic respiration? **(9)**

(b) Answer the following questions in relation to aerobic respiration as a two stage process.

(i) Where in the cell does the first stage take place?
(ii) Does the first stage require oxygen?
(iii) Comment on the amount of energy released in the first stage.
(iv) Where in the cell does the second stage take place?
(v) Does the second stage require oxygen?
(vi) Comment on the amount of energy released in the second stage.
(vii) State **two** ways in which the energy that is released is used in the human body.

(24)

(c) (i) Describe how you used yeast to produce alcohol (ethanol). Include a labelled diagram of the apparatus that you used.

(ii) How did you show that alcohol had been produced?

(27)

Q8 Section B 2005

8. (a) (i) What is an enzyme? .....

.....

(ii) Comment on the shape of enzyme molecules. .....

.....

(b) Answer the following questions in relation to an experiment that you carried out to investigate the effect of temperature on enzyme activity.

(i) What enzyme did you use? .....

(ii) What substrate did you use? .....

(iii) Draw a labelled diagram of the apparatus that you used.

(iv) How did you know that the enzyme had completed its activity?

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(v) How did you vary the temperature in your experiment?

.....

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(vi) Draw an outline graph of the results that you obtained.