



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2012

Centre Number

71

Candidate Number

Biology

Assessment Unit AS 1

assessing

Molecules and Cells

[AB111]

THURSDAY 7 JUNE, AFTERNOON



TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

There is an extra lined page at the end of this paper if required.

Answer **all eight** questions.

You are provided with **Photograph 1.6** for use with Question 6 in this paper. Do not write your answers on this photograph.

INFORMATION FOR CANDIDATES

The total mark for this paper is 75.

Section A carries 60 marks. Section B carries 15 marks.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You are reminded of the need for good English and clear presentation in your answers.

Use accurate scientific terminology in all answers.

You should spend approximately **20 minutes** on Section B.

You are expected to answer Section B in continuous prose.

Quality of written communication will be assessed in **Section B**, and awarded a maximum of 2 marks.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	

Total
Marks

- A rod-shaped organelle with a double membrane, the inner of which is highly folded.

- An organelle which contains genetic material and is surrounded by an envelope that contains pores.

- Finger-like extensions of the cell-surface membrane, which increase the surface area.

- A network of membrane-bound tubules and cisternae, responsible for synthesis and transport of lipid molecules.

- Layer between two plant cell walls that holds them together.

Examiner Only	
Marks	Remark

The diagram illustrates a segment of a DNA molecule. It shows three nucleotides connected in a chain. Each nucleotide is composed of a circular sugar-phosphate group, a pentagonal sugar, and a nitrogenous base. The bases are labeled A, T, and G from top to bottom.

- Answers: Adenine _____ Cytosine _____ Thymine _____ [2]

Examiner Only	
Marks	Remark

-
- [1]

-
- [1]

(c) Two types of genetic marker (**A** and **B**) are illustrated below for each of two individuals (1 and 2). The diagram below shows the base sequences on short sections of DNA with the genetic markers highlighted in bold.

Marker A	Individual 1	GTGC A TATATATATCCA
	Individual 2	GTGC A TATATATATATATATCCA
Marker B	Individual 1	ACCGTAC G GAGCCAT
	Individual 2	ACCGTAC A GAGCCAT

Marker A _____

Marker B _____ [2]

Examiner Only	
Marks	Remark

- 4 When cells are bathed in solutions with a water potential that is different to their cell water potential, their appearance may change due to osmosis. Some cells may be able to take corrective action to counteract the effects of osmosis.

(a) Red blood cells and onion cells behave differently when immersed in dilute (hypotonic) solutions. For each cell type, describe and explain fully the appearance of the cells after 10 minutes immersion.

- a red blood cell

- an onion cell

[3]

(b) *Paramecium* (shown below) is a single-celled organism, which lives in freshwater environments. Such environments cause *Paramecium* to take in water through the cell membrane by osmosis.



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ISBN 0340664436 "Reproduced by permission of Hodder Education".

(i) How does the water potential inside the *Paramecium* cell compare with that of the freshwater environment?

[1]

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-
- [1]

-
- [1]

-
-
-
- [2]

Examiner Only	
Marks	Remark

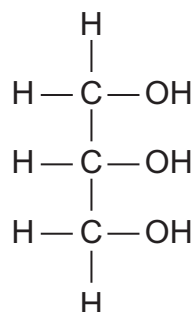
[3]

(i) Identify the stage of meiosis during which sister chromatids are pulled to opposite ends of the cell.

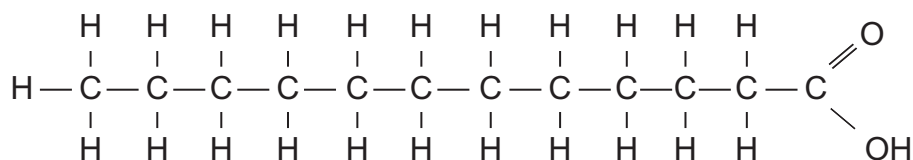
[2]

Examiner Only	
Marks	Remark

A



B



-

[1]

-

[1]

- (i) Describe the mechanism of action of an enzyme such as lipase.

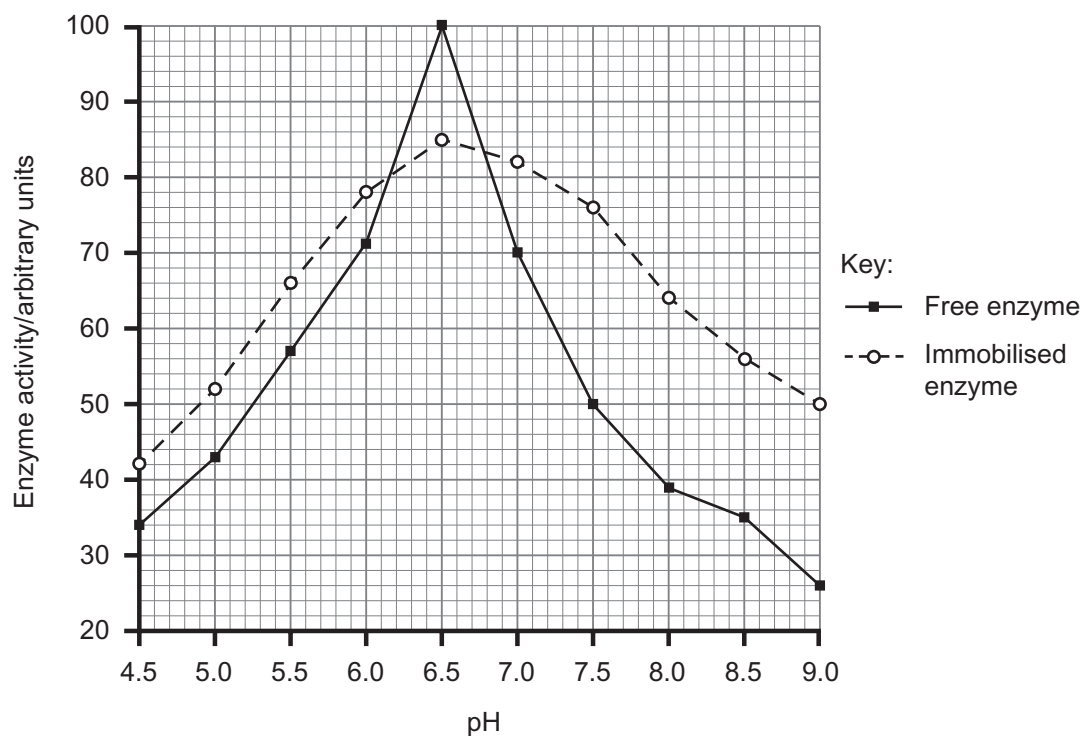
[3]

Examiner Only	
Marks	Remarks

[2]

[Turn over

- (c) Enzymes in biological washing powders are often immobilised in beads of silica. The graph below shows the activity of one enzyme in a free and in an immobilised state, over a range of pH values.



- (i) Describe the main differences in enzyme activity which result from immobilisation.

[2]

- (ii) Suggest explanations for the differences shown.

[2]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

[illegible]16

Examiner Only	
Marks	Remark

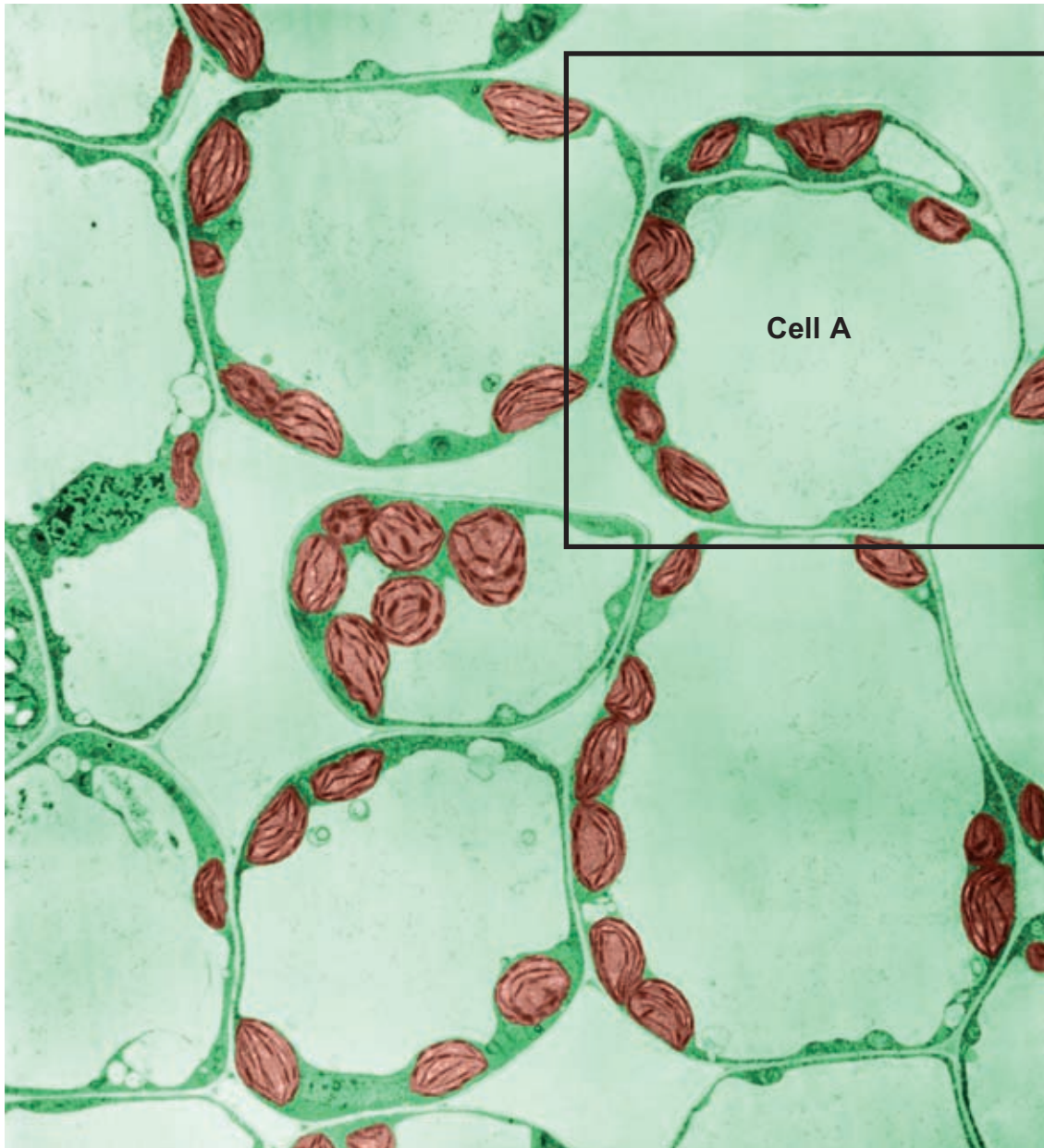
Role and distribution of starch, glycogen and cellulose

Examiner Only	
Marks	Remark

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GCE Biology Advanced Subsidiary (AS)
Assessment Unit AS 1: Molecules and Cells
June 2012

Photograph 1.6
(For use with question 6)



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