



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
 General Certificate of Education  
 Advanced Subsidiary Level and Advanced Level

CANDIDATE  
 NAME

CENTRE  
 NUMBER

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 NUMBER

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**BIOLOGY**

**9700/23**

Paper 2 Structured Questions AS

**October/November 2013**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces provided at the top of this page.

Write in dark blue or black ink.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

Electronic calculators may be used.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

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This document consists of **12** printed pages.



Answer **all** the questions

1 Fig. 1.1 is a diagram of an antibody molecule.

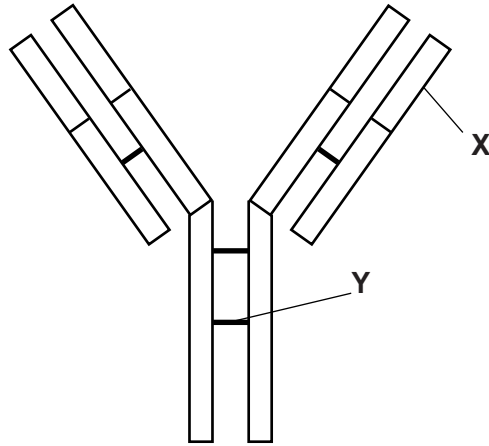


Fig. 1.1

(a) (i) Name the part labelled X.

..... [1]

(ii) Name the bond labelled Y.

..... [1]

(iii) The antibody molecule in Fig. 1.1 has quaternary structure.

Explain the meaning of the term *quaternary structure* as applied to proteins.

.....  
.....  
..... [1]





(d) Describe the role of ribosomes in protein synthesis.

*For  
Examiner's  
Use*

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..... [3]

[Total: 10]



(b) The magnification of Fig. 3.1 is  $\times 5000$ .

Calculate the diameter of the nucleus of cell **B** between lines **P** and **Q**.

Show your working and give your answer to the nearest micrometre ( $\mu\text{m}$ ).

answer .....  $\mu\text{m}$  [2]

(c) State the advantages of light microscopy, rather than electron microscopy, for studies of the cell cycle.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

[Total: 11]







- 5 (a) Describe the structure of a cellulose molecule **and** explain how cellulose is a suitable material for the cell walls of plants.

*description*

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.....

.....

.....

*explanation*

.....

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.....

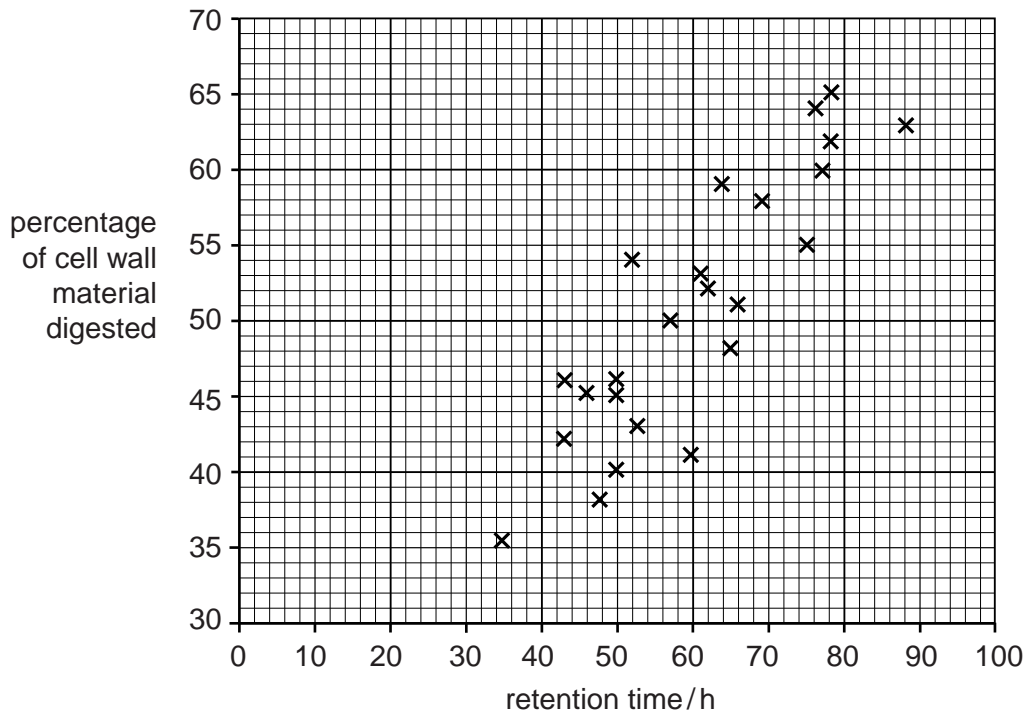
.....

.....

..... [4]

Animals do not have the ability to produce enzymes to digest cellulose. Most herbivores have bacteria in their digestive systems that can digest cellulose.

Fig. 5.1 shows the results of a study on 24 different herbivores. The percentage of cell wall material that was digested by each animal was determined. The time taken for the plant material to pass through the digestive system, the retention time, was also recorded.



**Fig. 5.1**

(b) (i) With reference to Fig. 5.1, describe the results of this study.

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..... [3]

(ii) Explain, in terms of energy flow in ecosystems, the importance of the results in Fig. 5.1.

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.....

..... [2]

(c) Digested material in animals is absorbed using both facilitated diffusion and active transport.

State two similarities **and** two differences between facilitated diffusion and active transport.

*similarities:*

1. ....

2. ....

*differences:*

1. ....

2. ....

[4]

[Total: 13]

**Question 6 starts on page 12**

6 Fig. 6.1 is a photomicrograph of phloem sieve tubes from a plant stem.

For  
Examiner's  
Use

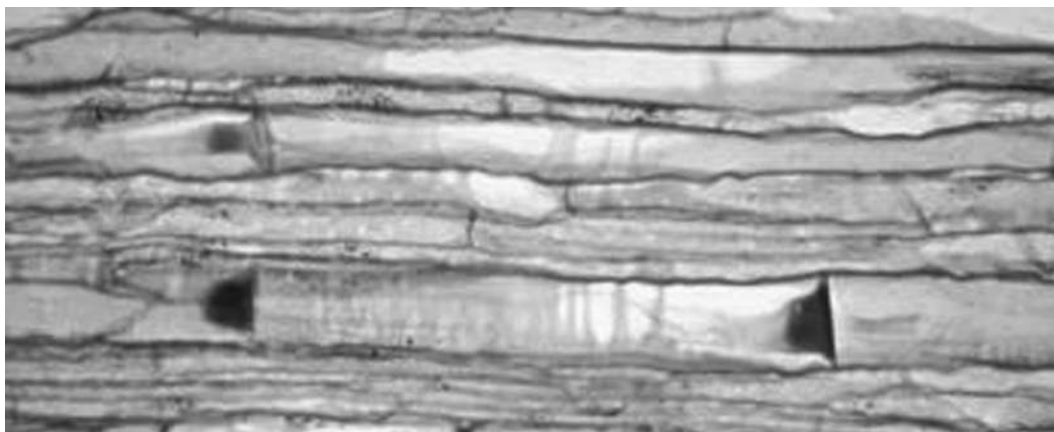


Fig. 6.1

(a) State two features, **visible in Fig. 6.1**, which distinguish sieve tubes from xylem vessels.

- 1. ....
- 2. ....

[2]

(b) Explain briefly how sucrose is **moved**, or translocated, **through** sieve tubes.

.....

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.....

.....

[2]

(c) Some enzymes are found in phloem tissue. Describe how enzymes catalyse reactions.

.....

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.....

.....

[3]

[Total: 7]

Copyright Acknowledgements:

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