



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE
NAME

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BIOLOGY

0610/31

Paper 3 Extended

May/June 2015

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 on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

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

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **18** printed pages and **2** blank pages.



2

1 (a) Fig. 1.1 shows five species of mollusc.

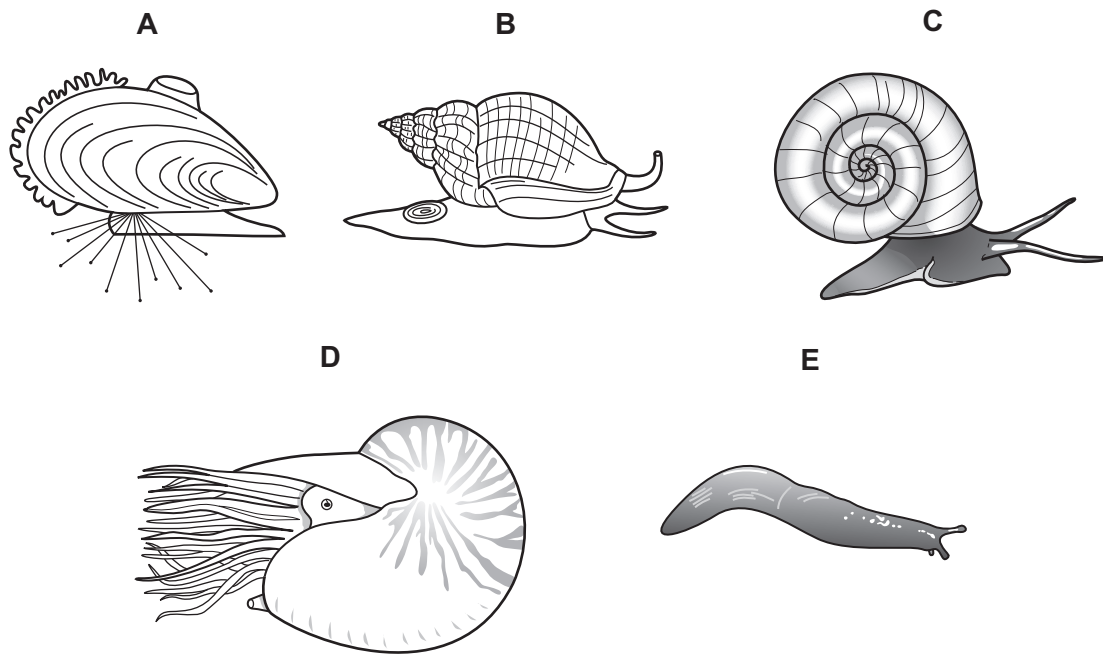


Fig. 1.1

Use the key to identify each species. Write the letter of each species (A to E) in the correct box beside the key.

Key

1 (a)	body is completely or partly covered in a shell	go to 2	
(b)	body is not completely covered or partly covered in a shell	<i>Limax flavus</i>	
2 (a)	shell is attached to rocks by thin threads	<i>Mytilus edulis</i>	
(b)	shell is not attached to rocks by thin threads	go to 3	
3 (a)	shell is a spire that comes to a point	<i>Buccinum undatum</i>	
(b)	shell is not a spire that comes to a point	go to 4	
4 (a)	animal has tentacles	<i>Nautilus pompilius</i>	
(b)	animal has 2 tentacles	<i>Planorbis planorbis</i>	

[3]

3

(b) State **two** features that are shown by all molluscs.

1

2

[2]

[Total: 5]

- 2 A student carried out an investigation to find the effect of carbon dioxide concentration on the rate of photosynthesis of an aquatic plant.

The apparatus that the student used is shown in Fig. 2.1. The student was advised to use a light meter positioned at the same distance from the lamp as the pond plant. The student counted the number of bubbles produced by the cut end of the stem.

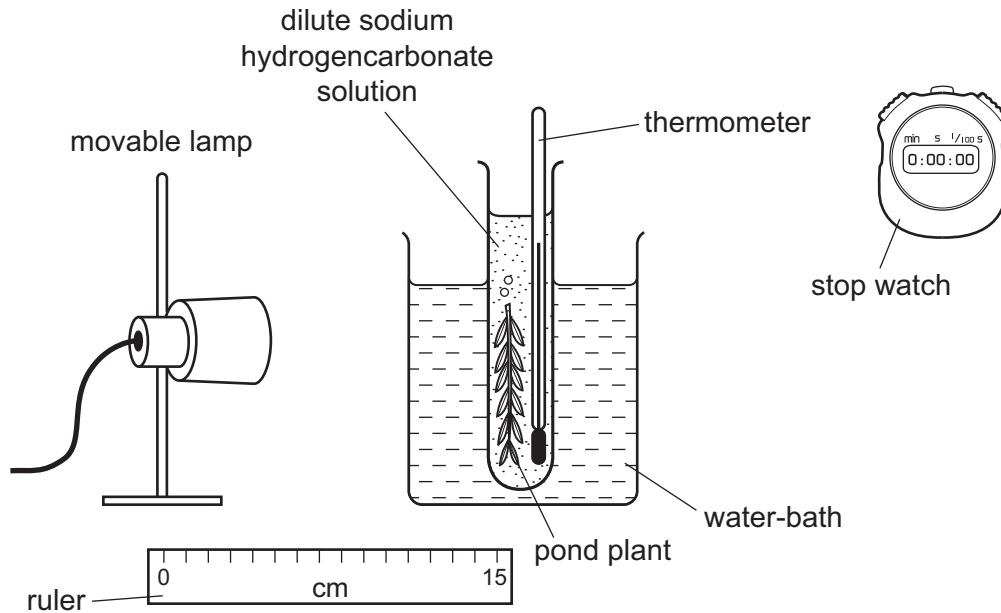


Fig. 2.1

- (a) Explain why the student included the following in the apparatus.

- (i) The beaker of water and the thermometer.

.....

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.....

.....

.....[2]

- (ii) The light meter and the ruler.

.....

.....

.....

.....

.....[2]

(iii) Suggest **and** explain the reasons for the shape of the graph in region Y.

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.....
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.....
.....[4]

(c) Counting bubbles may not be the best way to measure the rate of photosynthesis. The volume of the bubbles is not always exactly the same.

Suggest and explain **one** alternative way of measuring the gas given off to solve this problem.

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

(ii) Outline **two** social implications of using fertility drugs.

1

.....

2

.....

[2]

[Total: 17]

- 4 A biologist made a slide of some epidermal cells from a scale leaf of an onion bulb.

Fig. 4.1 is a drawing that the biologist made of one of the cells.

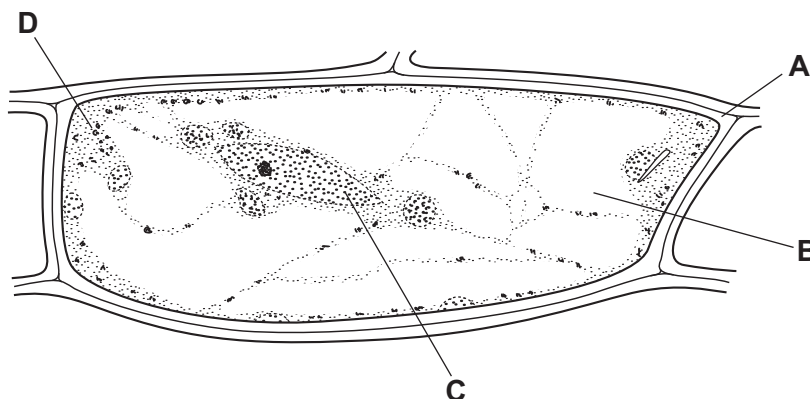


Fig. 4.1

- (a) Table 4.1 shows the functions of the structures within a plant cell.

Complete the table by:

naming the part of the cell that carries out each function

using the letters from Fig. 4.1 to identify the part of the cell named.

Table 4.1

function	letter from Fig. 4.1	name
resists the turgor pressure of the cell		
controls the activities of the cell		
site of the chemical reactions of the cell including synthesis of proteins		

[3]

5 Mammals have a double circulation system.

(a) Explain what is meant by a double circulation system.

.....

.....

.....[1]

(b) Table 5.1 shows some of the main organs in a mammal and the vessels that deliver blood and take it away.

Complete the table.

Table 5.1

organ	blood vessel	
	delivers blood	takes blood away
heart	1	1 aorta
	2 vein	2 artery
lungs	pulmonary artery
liver	1 hepatic artery	hepatic vein
	2	
kidney artery vein

[5]

- 6 Moose, *Alces americanus*, shown in Fig. 6.1, are large herbivores that primarily live in northern parts of North America. They have a varied diet that includes young shoots of willow trees and aquatic plants.



Fig. 6.1

Isle Royale is a large island in Lake Superior in the United States where there is a population of moose that has been studied by ecologists for a long time. The animals' only predator is the wolf. The island has a population of wolves that has changed in numbers over the years.

- (a) (i) Draw a food chain for the organisms in the passages above.

[2]

- (ii) Complete Table 6.1 by stating the name and identifying the trophic level of each organism in the food chain.

Table 6.1

name of organism	trophic level

[3]

- (iii) State **two** factors that influence the numbers of a top predator, such as wolves.

1

2

[2]

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