

Second Variant Question Paper



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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BIOLOGY

0610/32

Paper 3 Extended

May/June 2008

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 a pencil for any diagrams or graphs.

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

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

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.

For Examiner's Use

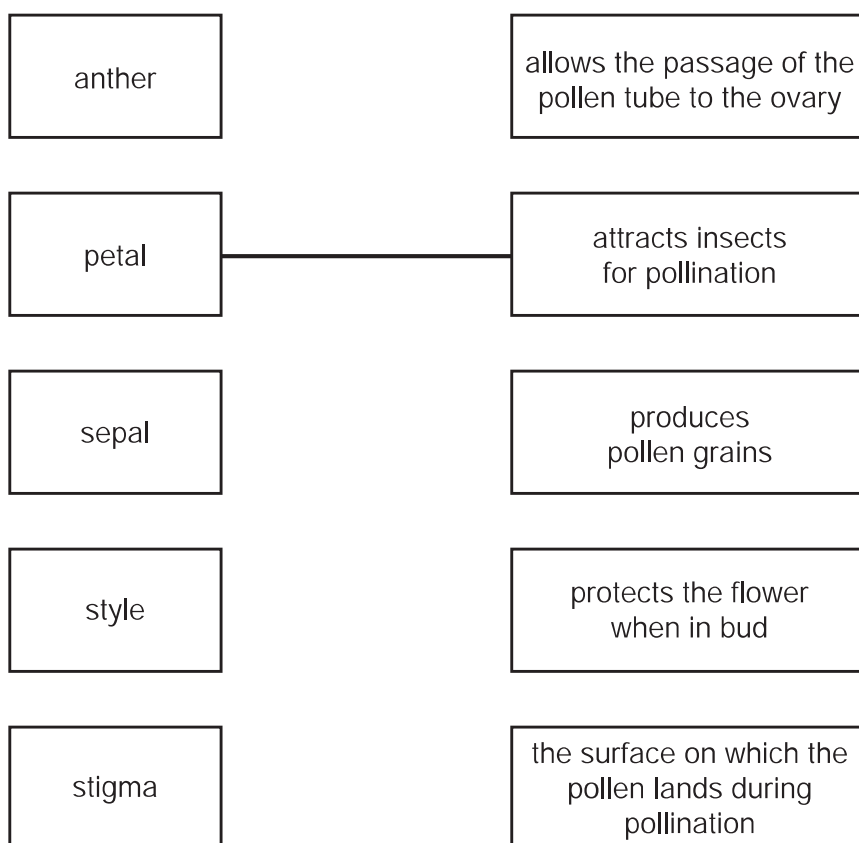
1	
2	
3	
4	
5	
Total	

This document consists of **13** printed pages and **3** blank pages.



- 1 (a) Using straight lines, match the names of the flower parts with their functions. One has been completed for you.

For
Examiner's
Use



[4]

- (b) Describe how the stigmas of wind-pollinated flowers differ from the stigmas of insect-pollinated flowers. Relate these differences to the use of wind as the pollinating agent.

.....

.....

.....

.....

..... [3]

- (c) Discuss the implications to a species of self-pollination.

.....

.....

.....

..... [3]

[Total: 10]

- 2 Fig. 2.1 shows *Salvinia molesta*, which is an Australian freshwater plant, introduced to the wetlands of Namibia as a source of animal food. However, in Namibia the plant reproduces much more quickly than in Australia. It quickly covers the surface of the water.

For
Examiner's
Use

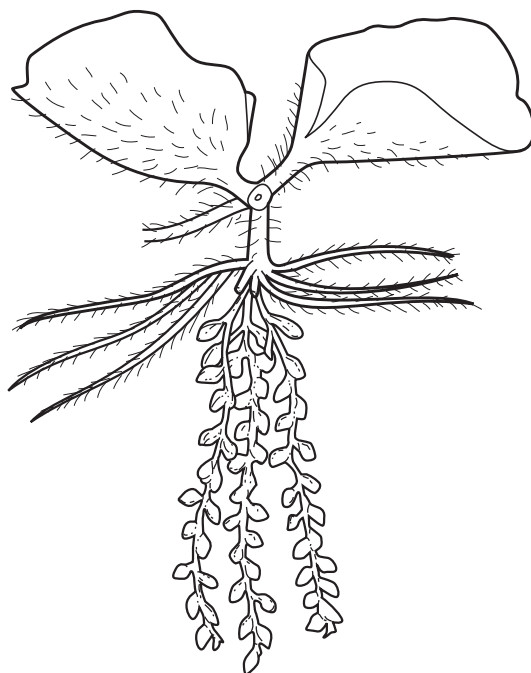


Fig. 2.1

- (a) Scientists are concerned about the environmental damage caused by *S. molesta* to the aquatic habitats in the ecosystem of the Namibian wetlands.

(i) Define the term *ecosystem*.

.....
..... [2]

(ii) Outline how *S. molesta* could damage the aquatic habitats of the wetland ecosystem.

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

- (b) *S. molesta* is being controlled using an Australian beetle, *Cyrtobagous saliniae*. The beetle eats the growing points of the plant.

For
Examiner's
Use

Suggest and explain why

- (i) it is better to use a natural consumer of the plant than to apply herbicides in the water to kill it,

.....

 [2]

- (ii) it could be dangerous to the wetland ecosystem to introduce Australian beetles.

.....

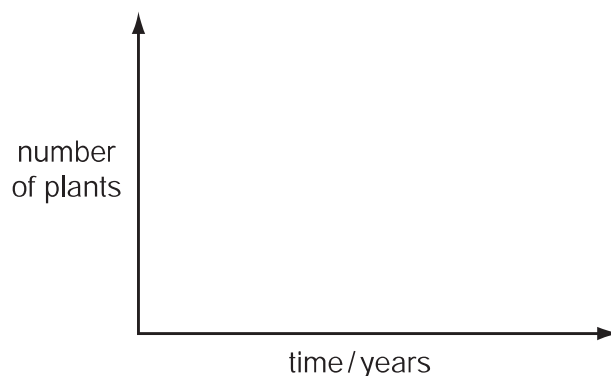
 [2]

- (c) The growth of *S. molesta* is now under control.

Its population growth has followed the pattern of a sigmoid curve.

- (i) Using the axes below, sketch a sigmoid growth curve for *S. molesta*. [1]

- (ii) Label the phases of the sigmoid growth curve. [3]



- (iii) Using the information given in this question (pages 3 and 4), state **one** factor that is limiting the growth of *S. molesta*.

..... [1]

(iv) Explain how two other named factors could also limit the growth of *S. molesta*.

For
Examiner's
Use

1.

.....

.....

2.

.....

..... [4]

[Total: 19]

3 Catalase is an enzyme found in plant and animal cells. It has the function of breaking down hydrogen peroxide, a toxic waste product of metabolic processes.

(a) (i) State the term used to describe the removal of waste products of metabolism.

..... [1]

(ii) Define the term *enzyme*.

.....

..... [2]

An investigation was carried out to study the effect of pH on catalase, using pieces of potato as a source of the enzyme.

Oxygen is formed when catalase breaks down hydrogen peroxide, as shown in the equation.



The rate of reaction can be found by measuring how long it takes for 10 cm³ oxygen to be collected.

(b) (i) State the independent (input) variable in this investigation.

..... [1]

(ii) Suggest two factors that would need to be kept constant in this investigation.

1.

2. [2]

Table 3.1 shows the results of the investigation, but it is incomplete.

Table 3.1

pH	time to collect 10 cm ³ oxygen / min	rate of oxygen production / cm ³ min ⁻¹
4	20.0	0.50
5	12.5	0.80
6	10.0	1.00
7	13.6	0.74
8	17.4	

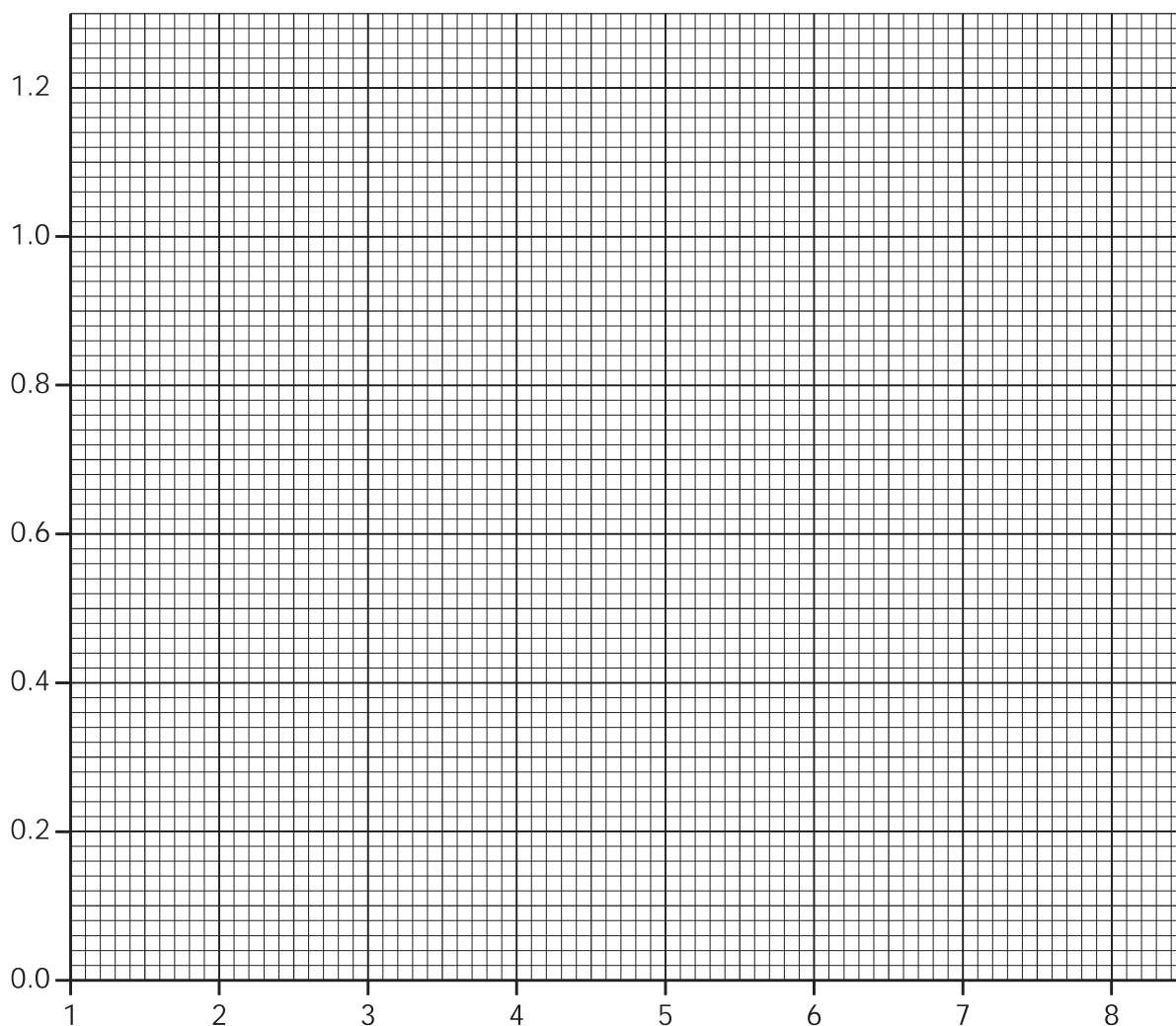
(c) Calculate the rate of oxygen production at **pH 8**.

Show your working. Write your answer in Table 3.1.

For
Examiner's
Use

[2]

(d) Complete the line graph by plotting the rate of oxygen production against pH.



For
Examiner's
Use

[4]

(e) (i) Using data from the graph, describe the changes in the reaction rate between **pH 4** and **pH 8**.

.....
.....
..... [2]

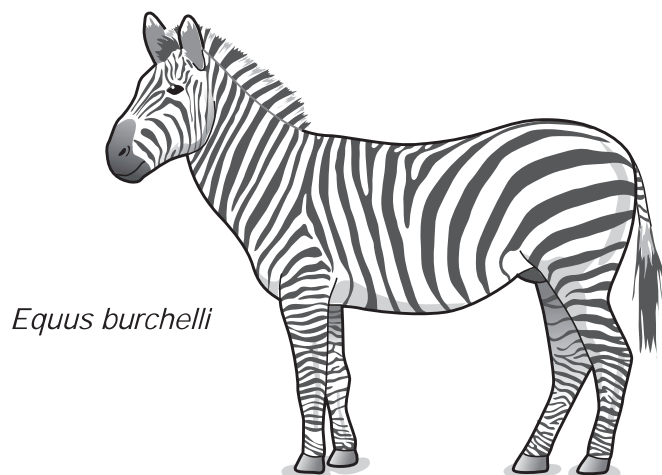
(ii) Explain the change in the reaction rate between **pH 6** and **pH 8**.

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

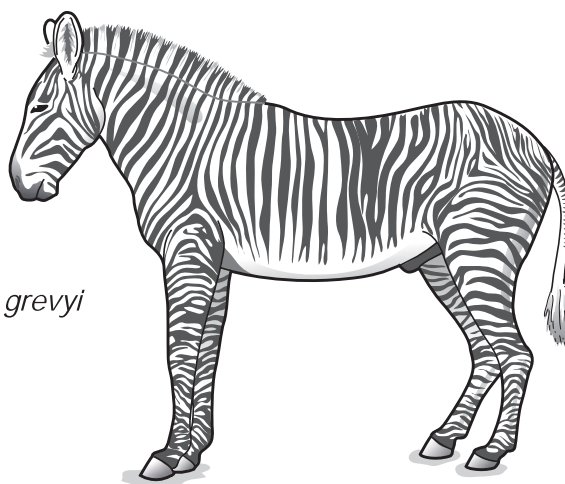
[Total: 17]

4 Fig. 4.1 shows three species of zebra.

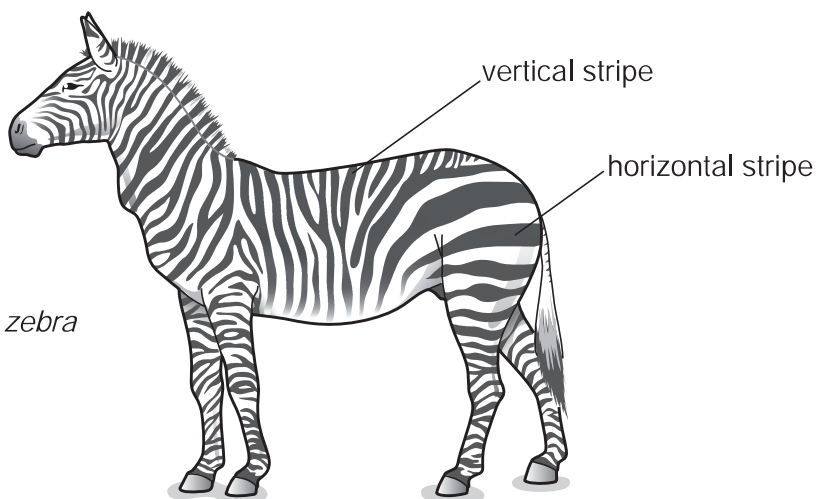
For
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Use



Equus burchelli



Equus grevyi



Equus zebra

Fig. 4.1

- (a) Describe **one** method a scientist could use to show that the zebras shown in Fig. 4.1 are different species.

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

- (b) Studies have shown that the hotter the environment, the more stripes zebras have.

- (i) State the type of variation which would result in different numbers of stripes.

..... [1]

- (ii) Study Fig. 4.1. Suggest which species of zebra lives in the hottest environment.

..... [1]

- (c) Occasionally, zebras are born that are almost completely black. The change in appearance is the result of mutation.

- (i) State the term that is used to describe the appearance of an organism.

..... [1]

- (ii) Define the term *mutation*.

.....
..... [2]

For
Examiner's
Use

- (d) Tsetse flies attack animals with short fur, sucking their blood and spreading diseases.

Fig. 4.2 shows a tsetse fly. This fly is an insect, belonging to the arthropod group.

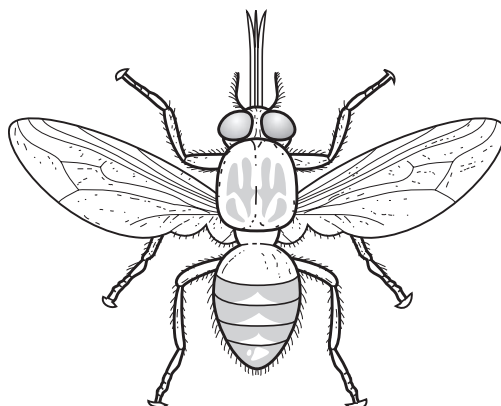


Fig. 4.2

- (i) State **one** feature, **visible in Fig. 4.2**, which is common to all arthropods.

..... [1]

- (ii) State two features, **visible in Fig. 4.2**, which distinguish insects from other arthropod groups.

1.

2. [2]

- (e) Scientists have discovered that zebras with more horizontal stripes attract fewer tsetse flies.

- (i) Suggest why the stripes on the head and neck of the zebra would be an advantage when it feeds on grass on the ground.

.....

..... [2]

- (ii) Describe how a species of zebra could gradually develop more horizontal stripes.

.....

.....

.....

..... [3]

[Total: 14]

5 To stay healthy we need a balanced diet.

(a) Define the term *balanced diet*.

For
Examiner's
Use

.....

.....

..... [2]

Protein is one nutrient present in a balanced diet. The body cannot store protein, so any excess amino acids are broken down in the process of deamination, as shown in Fig. 5.1.

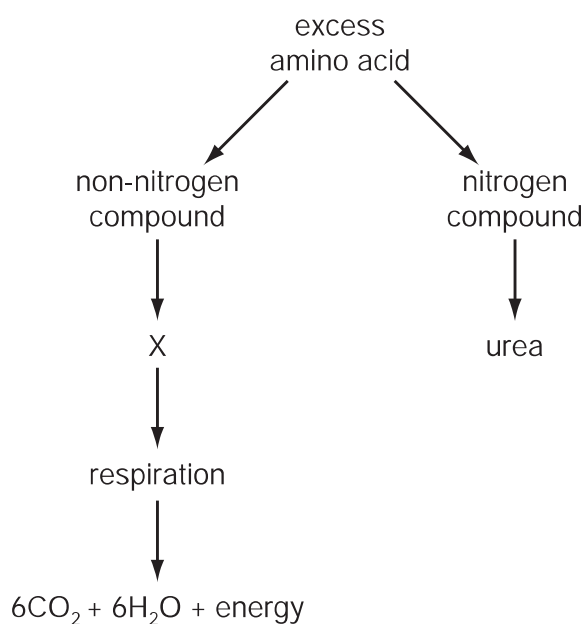


Fig. 5.1

(b) (i) Name the organ where deamination takes place.

..... [1]

(ii) Compound **X** is used as an energy source in respiration.

Suggest the name of compound **X**.

..... [1]

(iii) State the type of respiration shown in Fig. 5.1.

Explain your answer.

type of respiration

explanation

[2]

(c) The urea produced is transported to the kidney, where it is excreted.

Describe how urea is transported in the blood to the kidney.

.....

[2]

Fig. 5.2 shows a kidney tubule (nephron) and its associated blood vessels.

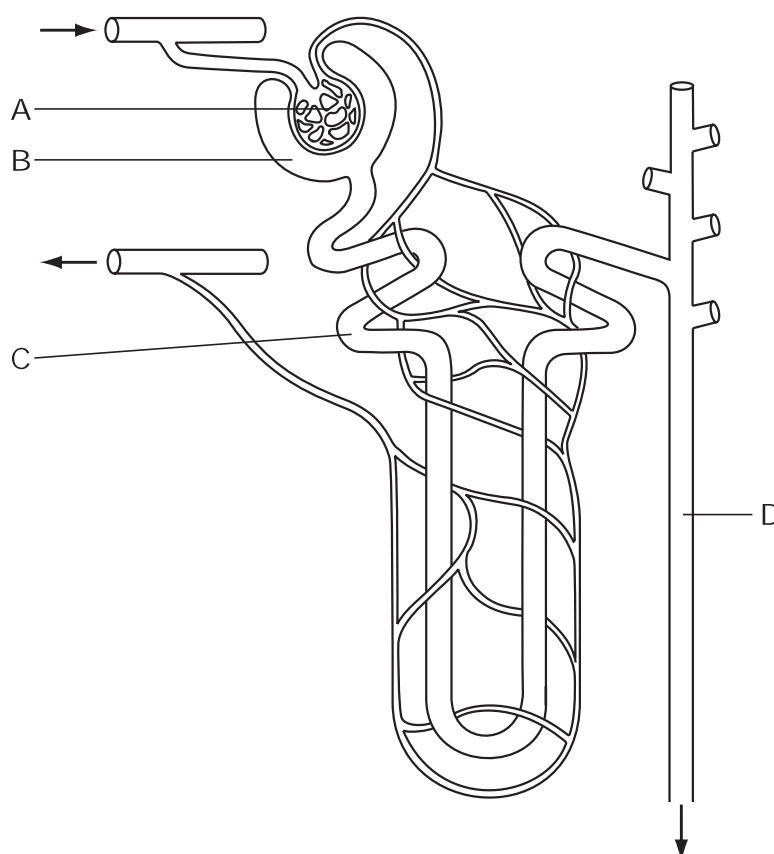


Fig. 5.2

For
Examiner's
Use

- (d) Complete the table by naming the parts labelled **A** to **D** and stating **one** function for each.

For
Examiner's
Use

	name of part	function
A
B
C
D

[8]

- (e) The volume of blood filtered by the kidneys is $1.18 \text{ dm}^3 \text{ min}^{-1}$.

- (i) Calculate the total volume of blood filtered in 24 hours.

Show your working.

volume = [2]

- (ii) If the total volume of urine produced in 24 hours is 1.7 dm^3 , calculate the percentage volume of the filtered blood excreted as urine in 24 hours.

Show your working.

% volume = [2]

[Total: 20]

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