

Candidate Name	Centre Number	Candidate Number
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General Certificate of Secondary Education

239/01

**ADDITIONAL SCIENCE
FOUNDATION TIER (Grades G-C)
BIOLOGY 2**

P.M. TUESDAY, 15 January 2008

(45 minutes)

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	4	
2.	8	
3.	7	
4.	8	
5.	8	
6.	9	
7.	6	
Total	50	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator.

INSTRUCTIONS TO CANDIDATES

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

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

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

You are reminded of the necessity for good English and orderly presentation in your answers.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

Answer all questions.

1. Cane toads were introduced into Australia from Central America. This was done in order to control beetles that were destroying sugar cane crops. They failed to control the beetles, and became a major pest themselves. Cane toads can harm native wildlife by eating small animals. The cane toads secrete a poison on their skin which poisons larger predators that try to eat them.



Cane toad

www.environment.gov.au

Using **only the information above**, answer the following questions:

- (a) Why were cane toads introduced into Australia? [1]

.....

- (b) In which part of the world would you normally find cane toads? [1]

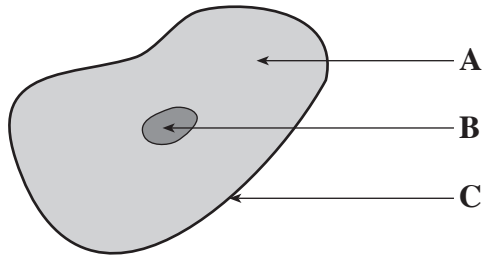
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- (c) Name **two** ways in which cane toads are harming the wildlife in Australia. [2]

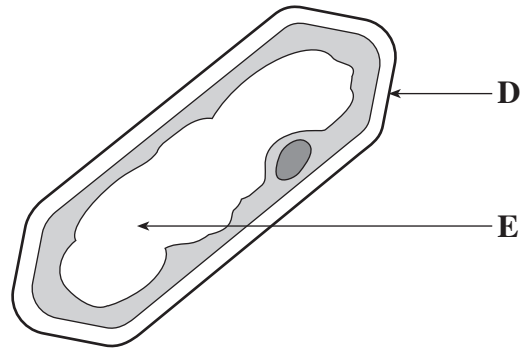
(i)

(ii)

2. The diagram below shows the structure of an animal and plant cell.



Animal Cell



Plant Cell

(a) Name parts **A** to **E** by using some of the following words. [5]

nucleus, vacuole, cell wall, chloroplast, cell membrane, cytoplasm

- A**
- B**
- C**
- D**
- E**

(b) Use the **letters from the diagram** to show which part: [3]

- (i) contains genes;
- (ii) is found **only** in plants;
- (iii) controls the entry of substances into the cell.

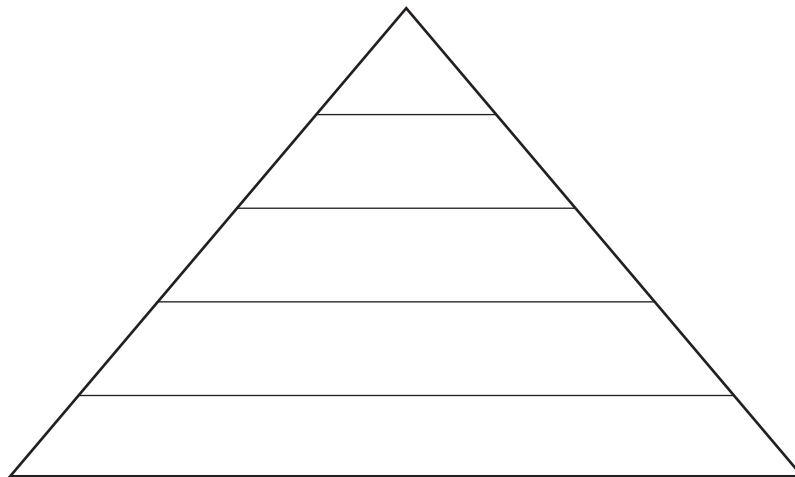
3. The numbers and types of organisms in a river are shown below.

<i>Organisms</i>	<i>Numbers</i>
Pike	2
Snails and worms	100 000
Rooted plants and algae	2 000 000
Trout	100
Crayfish and beetles	1000

(a) Using **only** the organisms above:

(i) Complete the pyramid of numbers.

[3]



(ii) Name the producers in this food pyramid.

[1]

.....

(iii) If the pike were removed from the river, what would happen to the number of trout?

[1]

.....

(iv) State **one other** effect of removing the pike from the river.

[1]

.....

(b) What is the source of energy for all food chains?

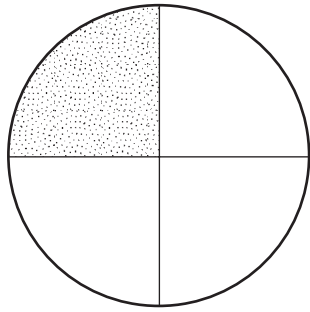
[1]

.....

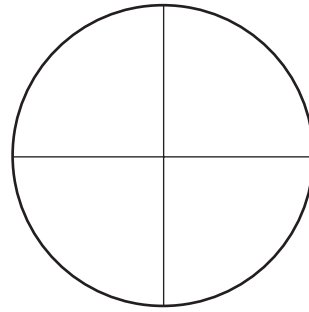
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4. Four lawns of the same size were tested with an equal volume of weed killer (herbicide). A different weed killer, A, B, C and D was sprayed on each lawn. The number of healthy and dead weeds on each lawn were later counted. The circles show the effect of each weed killer as a pie chart.

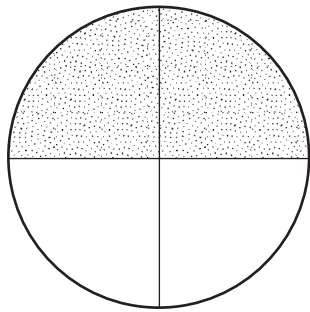
Lawn treated with weed killer A



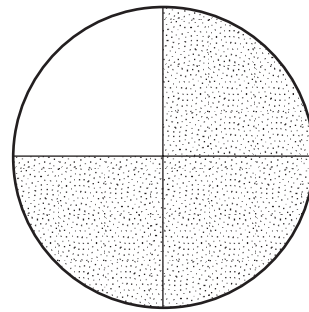
Lawn treated with weed killer B



Lawn treated with weed killer C



Lawn treated with weed killer D

Healthy
weedsDead
weeds

(a) What percentage of weeds was killed by weed killer C? [1]

.....

(b) Which weed killer had the least effect? [1]

.....

(c) Which weed killer would you recommend to use on a lawn?
Give a reason for your answer. [2]

Weedkiller

.....

.....

(d) Give **two** ways in which this investigation was a fair test. [2]

(i)

(ii)

(e) (i) Suggest **one** reason why you should not use a weed killer on a hedgerow in the countryside. [1]

.....

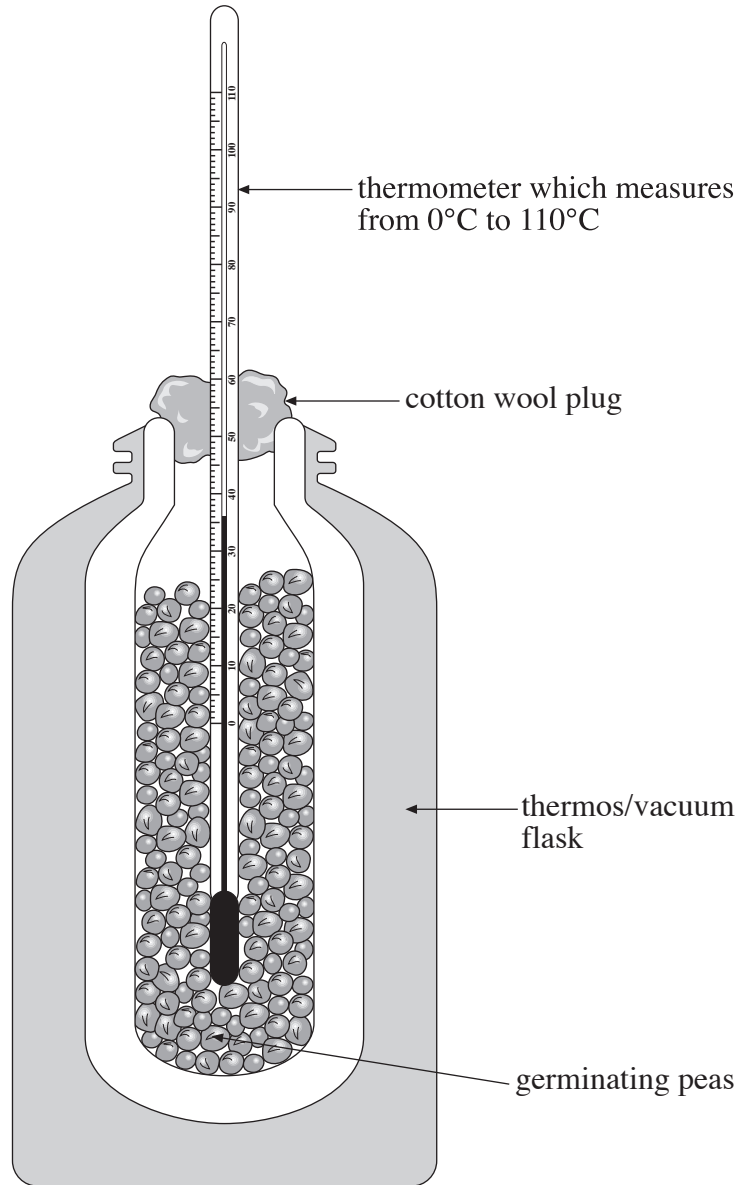
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(ii) Suggest a **different** reason why you should not use a weed killer on a vegetable garden. [1]

.....

.....

5. The apparatus below is used to show that heat energy is produced by germinating peas.



(a) What is the reading shown on the thermometer? [1]

..... °C

(b) (i) What process is releasing heat energy? [1]

.....

(ii) What gas will be produced in this process? [1]

.....

(c) Why is it important to use a thermos or vacuum flask rather than a glass beaker? [1]

.....

(d) Three thermos flasks, A, B and C were set up as shown in the table below. The temperature of each flask was noted over 5 days.

	<i>Temperature in °C</i>				
	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>
Flask A - live germinating peas	20.0	20.5	23.5	23.7	24.2
Flask B - dead peas	20.0	20.0	28.5	31.0	38.0
Flask C - dead, disinfected peas	20.0	20.0	20.0	20.0	20.0

(i) After 5 days what was the temperature rise in flasks **A** and **B**? [2]

A °C **B** °C

(ii) The peas in flask **B** were dead so why did the temperature increase? [1]

.....

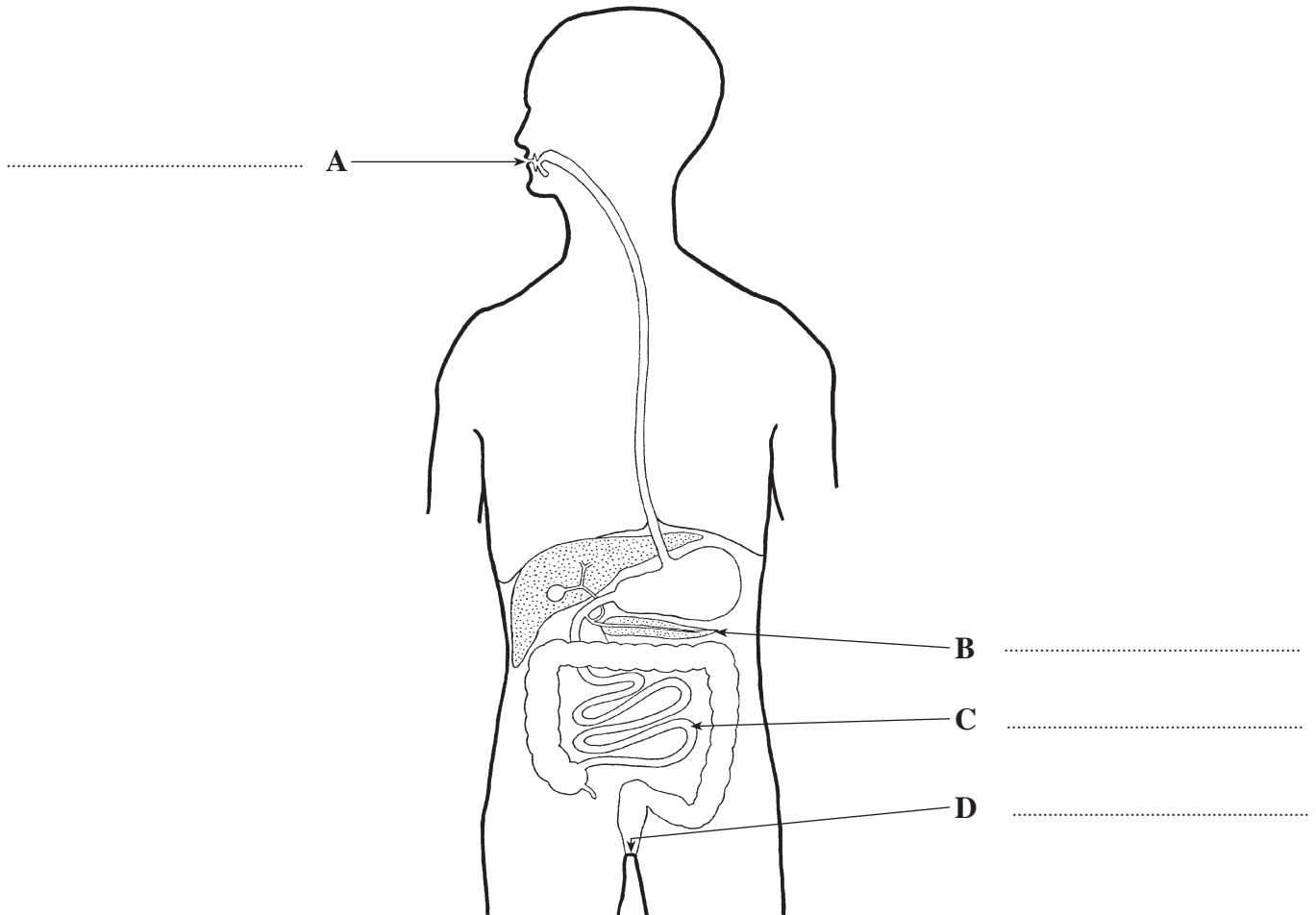
(iii) What was the purpose of the disinfectant in flask **C**? [1]

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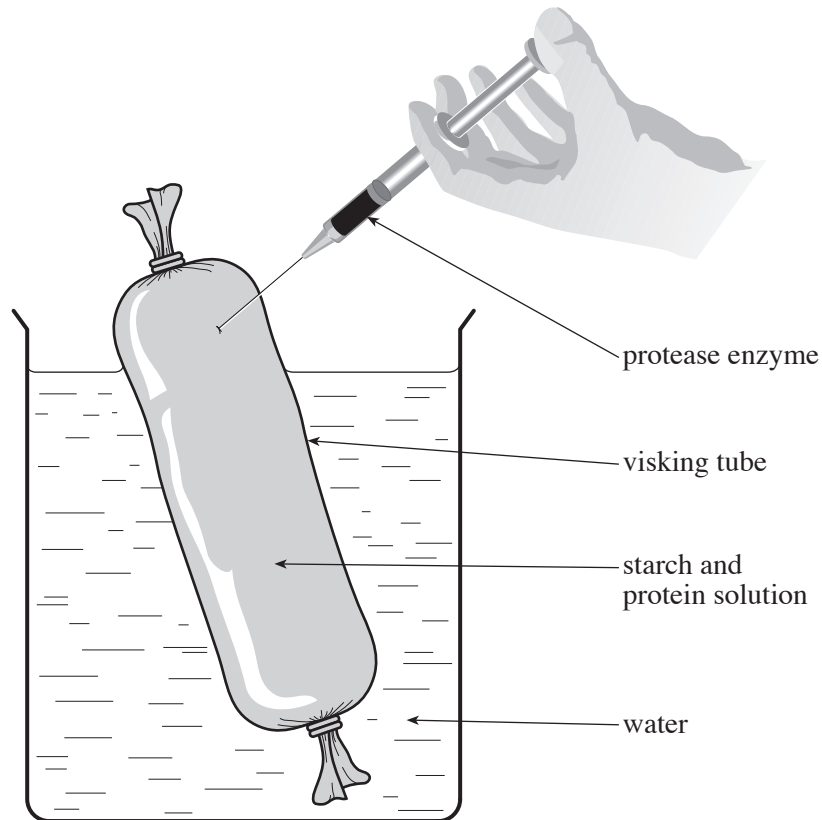
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6. (a) The diagram below shows the digestive system.
Name the parts labelled A-D.

[4]



- (b) In the experiment below a length of visking tubing was used to act as a model gut. The visking tubing was filled with a starch and protein solution.



A sample of the water surrounding the visking tube was taken every 15 minutes and tested for starch, protein, amino acids and glucose. After 45 minutes a protease enzyme was added to the contents of the visking tube. The results are shown below.

<i>Time/minutes</i>	<i>starch</i>	<i>protein</i>	<i>amino acids</i>	<i>glucose</i>
0	-	-	-	-
15	-	-	-	-
30	-	-	-	-
45	-	-	-	-
60	-	-	+	-
75	-	-	+	-
90	-	-	+	-

Protease added →

Key: + = substance present
- = substance absent

- (i) After the protease enzyme was added, amino acids were present in the sampled water. Explain this result. [2]

.....

.....

.....

- (ii) Explain why protein is not found in the sampled water. [1]

.....

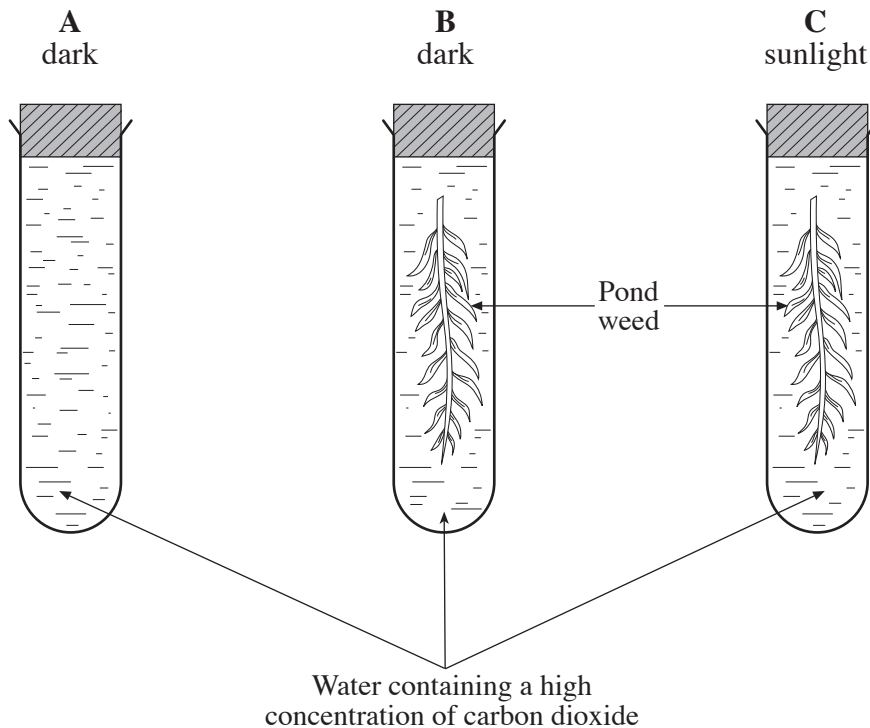
- (iii) (I) Name an enzyme that you would add to the contents of the visking tubing so that glucose was present in the sampled water. [1]

.....

- (II) State where in the digestive system this enzyme is made. [1]

.....

7. An experiment was carried out using the apparatus shown below.



Tubes **A**, **B** and **C** were of equal volume and were kept at the same temperature.

Tubes **A** and **B** were kept in the dark, but tube **C** was put in strong sunlight.

At the end of 1 hour, the volume of oxygen in each tube was measured. The results are shown below.

<i>Tube</i>	<i>Volume of oxygen at start of experiment /cm³</i>	<i>Volume of oxygen after 1 hour /cm³</i>
A	0.25	0.25
B	0.25	0.21
C	0.25	0.62

(a) Explain the purpose of tube **A**.

[1]

(b) Why is there less oxygen in tube **B** than tube **A** after 1 hour?

[1]

(c) Explain why the greatest volume of oxygen is in tube **C**.

[1]

(d) (i) Name the chemical that absorbs sunlight in green plants. [1]

.....

(ii) Where in the cell is this chemical found? [1]

.....

(e) State **one** use made by plant cells of the glucose produced in photosynthesis. [1]

.....