Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/51**

Paper 5 Practical Test **May/June 2018**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

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.

For Examiner's Use	
1	
2	
Total	

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

This document consists of **11** printed pages and **1** blank page.

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1 Young mammals feed on milk. Milk contains protein.

Some mammals produce an enzyme called rennin. Rennin changes the protein in milk so that it can be digested by another enzyme.

The action of rennin causes small lumps or clots to form in the milk.

You are going to investigate the effect of pH on the activity of the enzyme rennin.

Read all the instructions but DO NOT CARRY THEM OUT until you have drawn a table for your results in the space provided in 1(a).

Use the gloves and eye protection provided while carrying out the practical work.

Step 1 Label three test-tubes **P**, **Q** and **R**.

Step 2 Use a syringe to add 5 cm^3 of milk into each of test-tubes **P**, **Q** and **R**.

Step 3 Add two drops of acid to test-tube **P**.

Step 4 Add two drops of distilled water to test-tube **Q**.

Step 5 Add two drops of alkali to test-tube **R**.

Step 6 Label another three test-tubes **P1**, **Q1** and **R1**.

Step 7 Use a clean syringe to add 1 cm^3 of 0.1% rennin solution into each of test-tubes **P1**, **Q1** and **R1**.

Step 8 Raise your hand when you are ready for water to be added to the beaker labelled **water-bath**.

Step 9 Place all six test-tubes into the filled water-bath and leave them for three minutes.

Step 10 Pour the contents of test-tube **P1** into test-tube **P**.

Pour the contents of test-tube **Q1** into test-tube **Q**.

Pour the contents of test-tube **R1** into test-tube **R**.

Step 11 Leave test-tubes **P**, **Q** and **R** in the water-bath.

Immediately start the stop-clock.

The empty test-tubes, **P1**, **Q1** and **R1** can be placed in the test-tube rack.

Step 12 After one minute, take test-tube **P** out of the water-bath.

Tip and rotate test-tube **P** as shown in Fig. 1.1.

Observe the milk, and decide which stage of clotting (**no clotting**, **some clotting** or **all clotted**) it has reached.

Record your result in your table.

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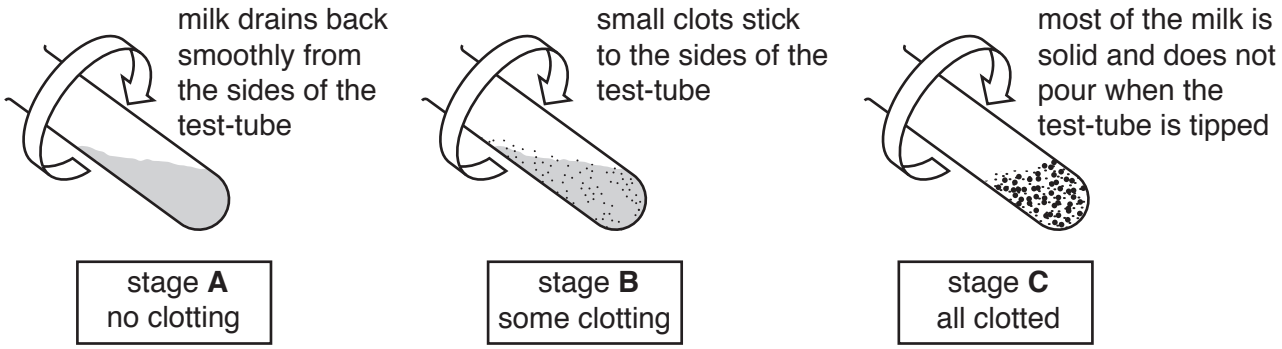

Fig. 1.1

Step 13 Put test-tube **P** back into the water-bath.

Step 14 Repeat steps 12 and 13 for test-tubes **Q** and **R**.

Step 15 Repeat steps 12, 13 and 14 every minute for five minutes.

(a) Prepare a table in which to record your results.

View solution

[4]

(b) State a conclusion for your results.

View solution

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..... [2]

(c) **(i)** Suggest why, in step 9, all the test-tubes were placed into the water-bath for three minutes before mixing the contents together in Step 10.

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..... [1]

(ii) State **two** variables which have been kept constant in this investigation.

View solution

1 .....

2 .....

[2]

(d) Identify **four** sources of error in this investigation.

View solution

1 .....

.....

2 .....

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3 .....

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4 .....

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[4]

(e) Identify **one** hazard associated with this procedure that required you to wear eye protection.

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..... [1]

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(f) Clotting separates milk into a solid part and a liquid part.

View solution

Describe how you could find out if there was any protein remaining in the liquid part.

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..... [2]

(g) After rennin has changed the protein in milk into a white solid, protease enzymes can be used to digest the protein. The digested protein forms a colourless liquid.

View solution

A hypothesis stated:

The optimum temperature for protease enzymes to digest changed milk protein is 37 °C.

Describe a method that could be used to test this hypothesis.

Do **not** carry out this investigation.

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..... [6]

[Total: 22]

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2 A student wanted to investigate a garden ecosystem.

She counted the number of insects caught in spider webs in one small section of the garden.

She found six spider webs in the small section of garden sampled.

Diagrams of the spider webs are shown in Fig. 2.1. Each black dot represents one insect caught in a spider web.

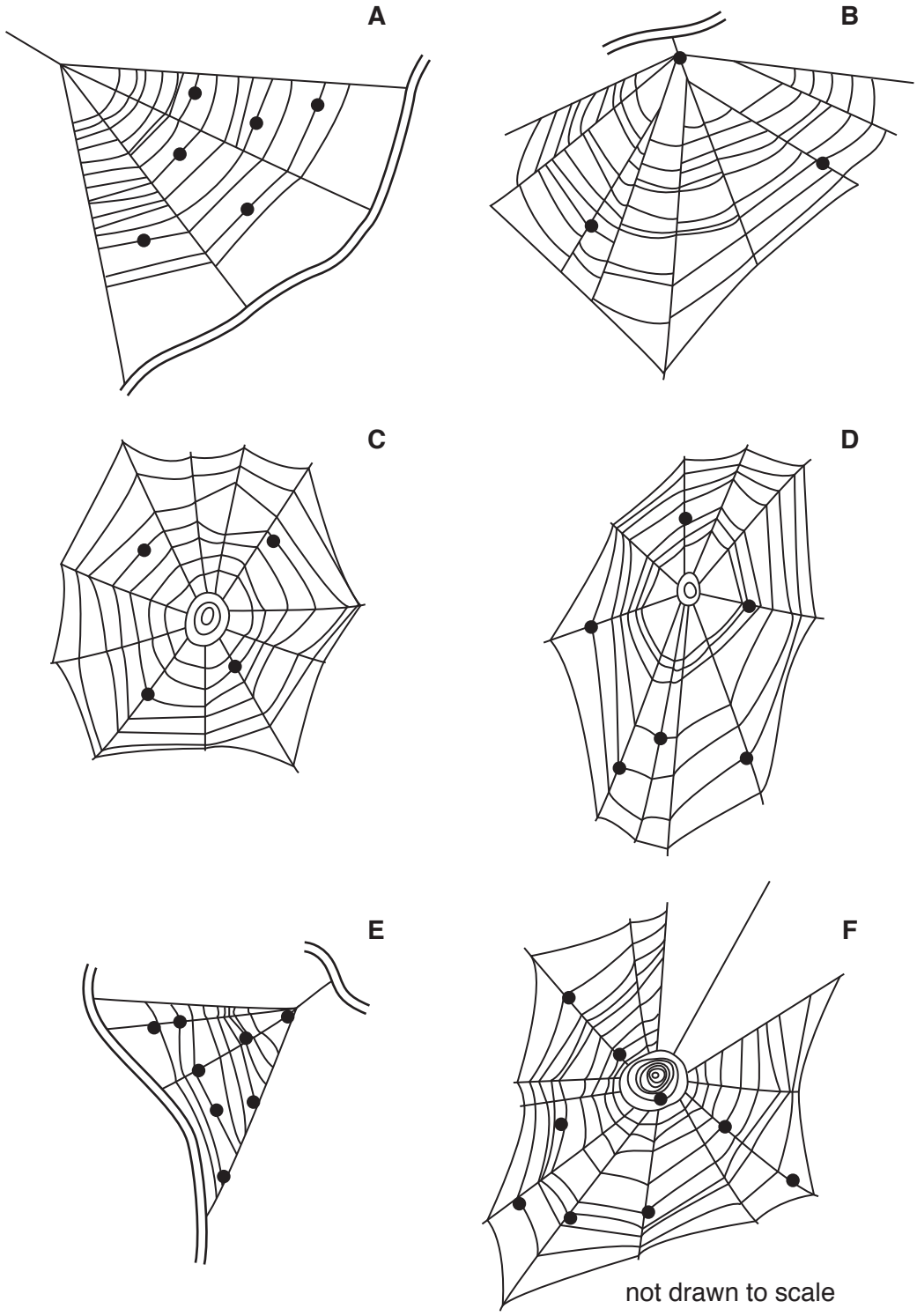

Fig. 2.1

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(a) (i) Use Fig. 2.1 to complete Table 2.1.

View solution

Table 2.1

spider web	number of insects caught in each web
A	
B	
C	
D	
E	
F	
total	

[2]

(ii) Calculate the average number of insects per web in the small section of garden, using the information in Fig. 2.1 and Table 2.1.

View solution

Space for working

..... [1]

(iii) The student counted the total number of spider webs in the whole garden and found that there were a total of 102 spider webs.

Use this information and your answer to part **2(a)(ii)** to estimate the total number of insects caught in webs in the whole garden.

View solution

Space for working.

..... [1]

(iv) Suggest **one** reason why the estimated total number of insects caught in webs in the whole garden may not be accurate.

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.....

..... [1]

View solution

(b) Fig. 2.2 is a photograph of a spider.

A spider's body has two main parts. The legs are all attached to the cephalothorax which is the upper part of the body and starts at label **X** on Fig. 2.2. The lower part of the body is called the abdomen and is nearest to label **Y** on Fig. 2.2.

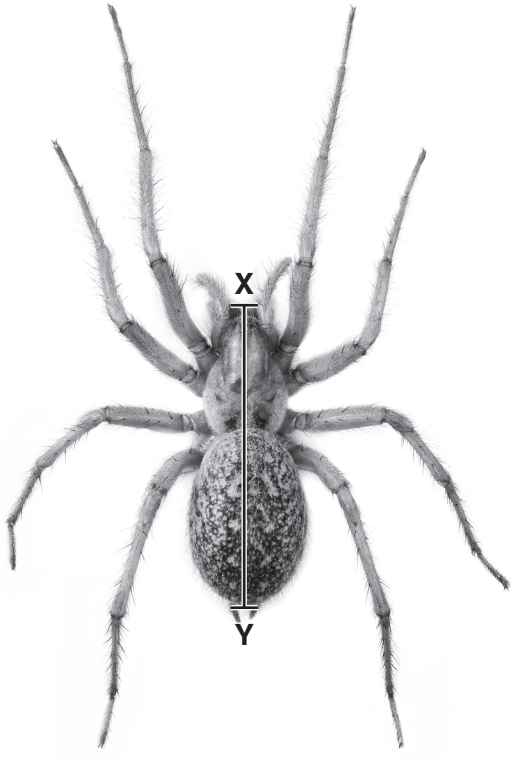

Fig. 2.2

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(i) Make a large drawing of the spider in Fig. 2.2 to show its outline, including its legs.

View solution

Label the abdomen.

[5]

(ii) Measure the length of the spider between points **X** and **Y** on Fig. 2.2. Include the units.

Length of line **XY** on the spider in Fig. 2.2 .....

Draw a line in the same position on your drawing and measure the length on your drawing.

Length of line **XY** on the spider in your drawing .....

Calculate the magnification of your drawing using your measurements and the following equation:

View solution

$$\text{magnification} = \frac{\text{length of line } \mathbf{XY} \text{ on your drawing}}{\text{length of line } \mathbf{XY} \text{ on Fig. 2.2}}$$

Space for working.

.....

[3]

(c) Table 2.2 contains some other data collected by the student from the garden ecosystem.

Table 2.2

type of organism	number found in the garden ecosystem
trees	2
bushes	5
other plants	37
herbivores	118
carnivores	14

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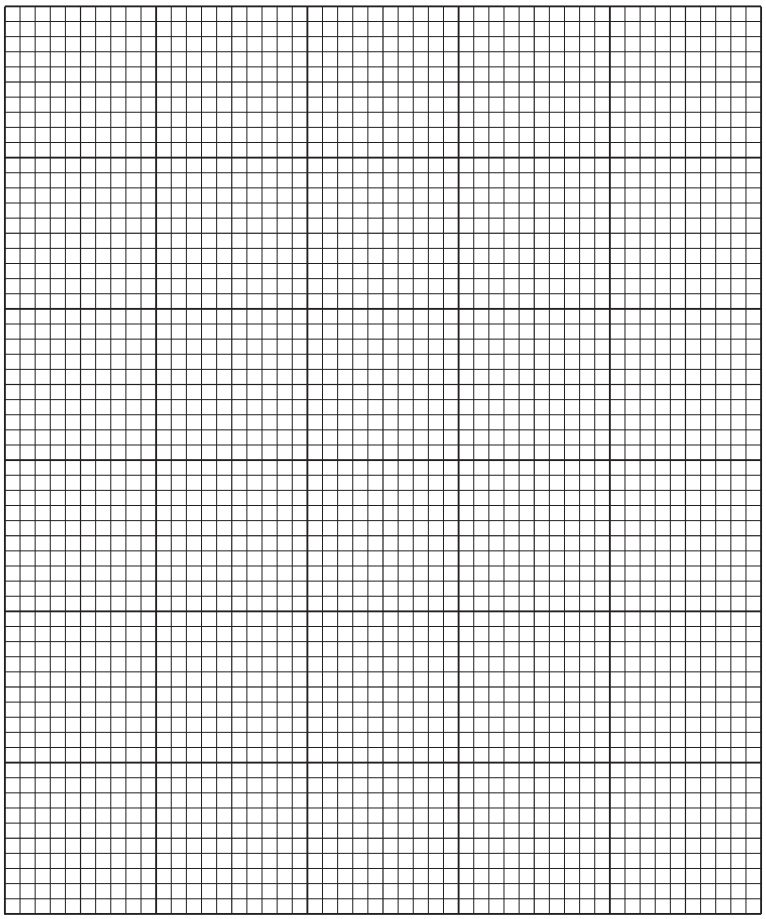
(i) Plot a bar chart of the data in Table 2.2.

View solution



[3]

(ii) Herbivores and carnivores are animals.

View solution

Use the data in Table 2.2 to calculate the ratio of animals to plants.

Show your working and give your answer in its simplest form.

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[2]

[Total: 18]

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