UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

* 5 3 3 5 7 5 1 3 1 9 *

Biology **0610/51**

Paper 5 Practical Test **October/November 2010**

1 hour 15 minutes

Candidates answer on the Question Paper

Additional Materials: As listed in Instructions to Supervisors

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 medium (HB) pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **both** 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	
Total	

This document consists of **8** printed pages.

© UCLES 2010

For Examiner's Use

1 Enzymes are used commercially to extract fruit juices. The use of enzymes increases the volume of juice produced.

You will investigate the volume of fruit juice produced using no enzyme and two concentrations of enzyme.

The container, labelled **W1**, contains apples that have been blended into a pulp.

The test-tube, labelled **0%**, contains water with **no enzyme**.

The test-tube, labelled **1%**, contains a 1% solution of the enzyme.

The test-tube, labelled **3%**, contains a 3% solution of the enzyme.

Each test-tube contains 5 cm^3 of liquid.

Proceed as follows

- Label the three small containers **0%**, **1%** and **3%**.
- Divide the apple pulp equally into the three containers.
- To the sample of apple pulp labelled **0%**, add the contents of the test-tube labelled **0%** and stir the contents carefully with the plastic spoon.
- Clean the spoon before using it again.
- Repeat the procedure by adding the contents of the test-tube labelled **1%** to the sample of apple pulp labelled **1%**.
- Repeat the procedure by adding the contents of the test-tube labelled **3%** to the sample of apple pulp labelled **3%**.
- Record the time in the space below and leave the three containers to stand for 15 minutes to allow the enzyme to act.

Space to record time .....

During the 15 minutes

- Read the rest of this question and answer **(a)**. If you have time you should start **Question 2**.

(a) Prepare a suitable table to record the volumes of juice that will be produced after filtering the three mixtures and the appearance of each juice.

[5]

© UCLES 2010

- After 15 minutes, filter each of the mixtures using the apparatus provided, as shown in Fig. 1.1**A**. If using coffee filters fold the top edge of the paper over the edge of the cup, as shown in Fig. 1.1**B**.

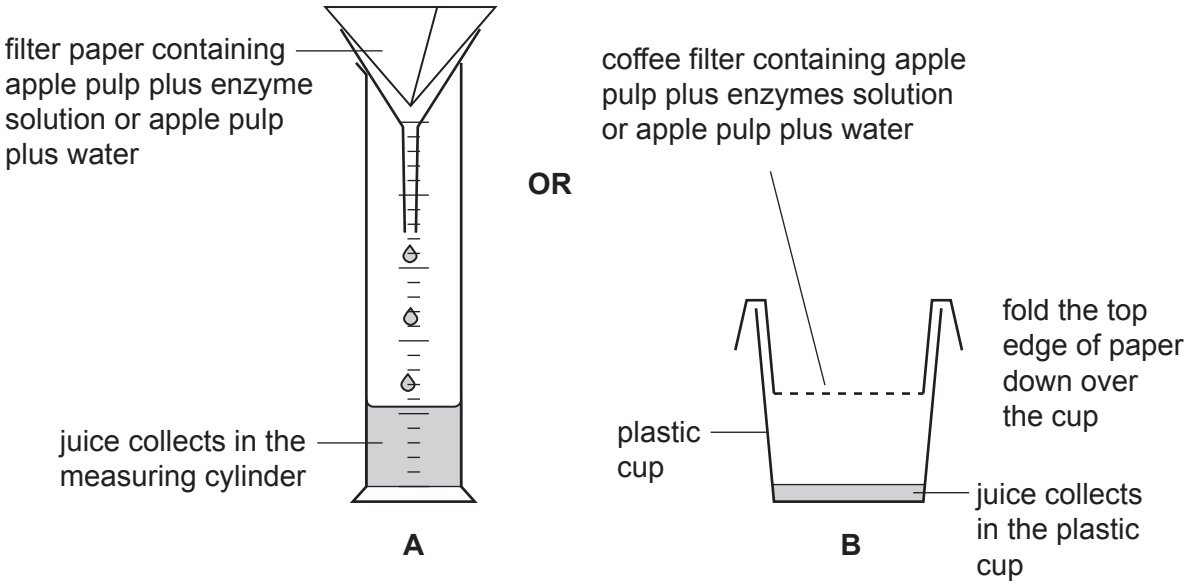


Fig. 1.1

- Allow the juice from each mixture to filter for 10 minutes.
- Record the appearance of each juice in the table.
- Measure the volume of juice collected from each mixture using the measuring cylinder. Record your results in the table.

(b) (i) Compare the results and observations that you have recorded for the three samples of fruit juice.

.....

.....

.....

.....

.....

..... [3]

(ii) Suggest how you might improve this investigation.

.....

.....

.....

..... [3]

(c) (i) Describe, but do **not** carry out, an investigation to show the effect of pH on the activity of the enzyme that is used to extract apple juice.

For Examiner's Use

.....

.....

.....

.....

.....

.....

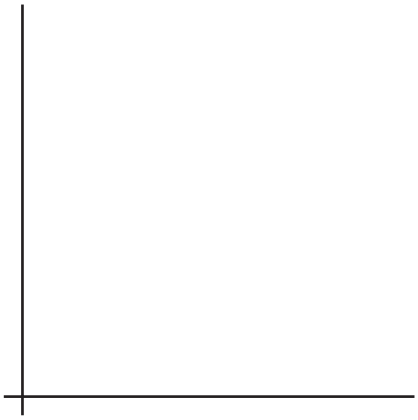
.....

.....

.....

..... [6]

(ii) Using the space below, show how you would plot the effects of pH on the activity of the enzyme in a graphical form.



[3]

[Total: 20]

© UCLES 2010

2 Specimen **W2** is a preserved honey bee, *Apis mellifera*.

Do **not** touch specimen **W2**.

Use forceps to turn the specimen on its side.

(a) Make a labelled drawing of a back leg of **W2**. Use the hand lens provided to observe the detail.

[5]

For Examiner's Use

For Examiner's Use

Honey bees are important in pollination when they gather nectar from flowers.
The nectar is used for making honey.
Honey contains pollen grains which identify the flowers that the nectar was gathered from.

Fig. 2.1 shows some pollen grains in a sample of honey as seen with a microscope.

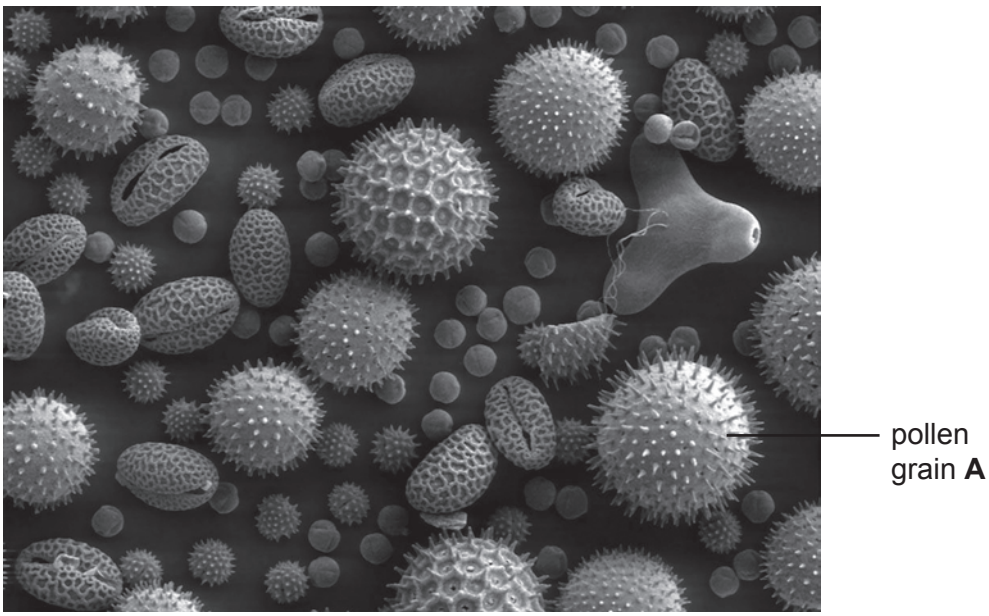


Fig. 2.1

(b) (i) Measure the diameter of pollen grain **A**. Draw a line on Fig. 2.1 to show where you have made your measurement.

diameter of pollen grain **A** in Fig. 2.1 ..... mm [1]

(ii) Calculate the actual diameter of pollen grain **A**.

actual diameter of pollen grain **A** ..... mm [2]

For Examiner's Use

(c) (i) Describe how you could safely test the sample of honey, labelled **W3**, for:

starch, ...

.....

reducing sugar. .....

.....

.....

.....

..... [4]

- Carry out these tests on **W3**. If you require hot water, raise your hand and it will be brought to you.

(ii) Record your observations and state your conclusions on the starch and reducing sugar content of **W3** in Table 2.1.

Table 2.1

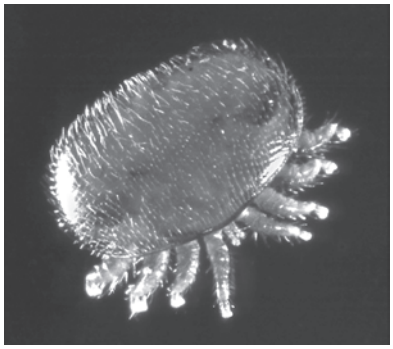
test	observation	conclusion
starch		
reducing sugar		

[4]

For Examiner's Use

Honey production has been affected by parasites found on both the adult and larval stages of honey bees.

One of the latest pests has been identified as a blood sucking parasite, *Varroa destructor*. Fig. 2.2 shows the external appearance of this parasite.



· 60

Fig. 2.2

(d) Name the arthropod groups to which the honey bee, *Apis mellifera*, and the parasite, *Varroa destructor*, belong.

For each organism, describe one feature which leads to your identification.

organism	arthropod group	reason
honey bee (*Apis mellifera*)	……..	……. ……...
parasite (*Varroa destructor*)	……..	……. ……...

[4]

[Total : 20]

Copyright Acknowledgements:

Question 2 © http://autopollen.massey.ac.nz; 06/08/09.

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.